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General Articles

SOME POULTRY DISEASES*

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I presume that I have had the honour of being invited to present a paper on poultry diseases because diagnosis work has been, and is being, carried out to a considerable extent at the College and some of our observations may be of interest and of value to the members of the Association.

The study of poultry diseases is a department of veterinary work which has not attracted the general practitioner in the country in view of the small value of individual birds, but it can be claimed that if that interest were aroused a very valuable contribution could be made by the profession to the prosperity of the poultry industry.

The importance of that industry may be realised if reference be made to the statistics regarding the poultry population and value of the exports of poultry produce from this country.

In the Annual Report of the Minister of Agriculture for Saorstat Eireann for 1931-32 the number of poultry is given as 22,782,229, and the value of exports of poultry, eggs and feathers totals £3,572,601. The value of this produce exported is greater than that for sheep and much higher than that for horses.

The importance of the disease problem among poultry can be indicated in a very general way. In the College 1,000 to 2,000 fowls are submitted to *post-mortem* examination annually. These birds, dead or alive, are forwarded from different parts of the country in order to obtain information regarding the cause of death or the nature of the disease that may be present, together with its control or prevention. They must, however, be held to represent only a very small proportion of the losses among poultry in this country from disease. It is only a comparatively small number of the poultry keepers who go to the trouble of sending their dead birds for examination and those owners are the most enlightened or are more carefully supervised.

During the year 1931-32 the number of birds examined was 2,037. These birds were chiefly chickens and adult fowls, but there were also some turkeys, and a few ducks and geese.

Among them the number of outbreaks of contagious disease detected were:—

Bacillary white diarrhœa ...	230
Coccidiosis	140
Tuberculosis	65
Fowl typhoid	25
Fowl pox	32
Black head in turkeys	23
Black head in fowls	13
Leukæmia	22
Aspergillosis	4
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The last two diseases claimed single victims only in individual flocks, while the first two caused very serious losses and a varying proportion of birds died in outbreaks caused by the remaining diseases mentioned.

To this may be added a second list of other affections observed during that year:—

Fowl paralysis	20
Peritonitis and inflammation of the oviduct	123
Rickets	57
Enteritis	158
Congestion of the lungs ...	43
Impaction of the gizzard or bowel	45
Phosphorus poisoning	9
Intestinal worms	36
Gout	35
Rupture of the liver	37
Tumours	14
Rupture of the intestines ...	7
Hæmangiomata of the skin ...	3
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Many of these diseases represent single losses in flocks, *e.g.*, tumours, intestinal rupture, rupture of the liver, and peritonitis (but the latter may be mentioned as one of the most common causes of death in laying fowls). In several of the other diseases, however, considerable losses were experienced at times, no doubt on account of the exposure of the flocks to the same conditions as regards feeding and management. That has been observed in connection with poisons, rickets, enteritis, worm parasites and gout. In the main, however, it is the contagious diseases which form the greatest menace to the poultry industry.

From our own observations and the information we have gathered it may be concluded that poultry diseases are widespread throughout the

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country and it is coming to be recognised that they form one of the greatest problems which confront the poultry industry in this and other countries and adversely affect its prosperity. The reason for this is not far to seek. In the old days poultry were regarded as a sort of sideline of the farmer's wife and they were kept on free range. Now poultry are being selected for breeding for their egg-laying and fattening qualities, larger numbers are being reared and maintained in more or less confined runs or enclosures, and incubators, hovers and brooders are coming into general use. Moreover, poultry keeping has been taken up as their chief or only occupation by persons, some of whom have had no previous experience of the work or the problems of the industry, and it may be taken as an axiom that the more poultry that are maintained on a given space, the more likely is a contagious disease to spread once it appears in their midst.

It must not be inferred from what I have already stated that this country is worse off in respect of poultry disease than other countries. Indeed, it may be stated at once that from what we can learn the contrary is the case. This favourable position probably at least in part depends upon the comparatively small units owned by individual poultry keepers and the small numbers of poultry imported. In addition, this country is free from such virulent contagious diseases as fowl plague and Newcastle disease and no outbreak of fowl cholera has been brought to our notice for over 20 years.

At the same time, it must be acknowledged that substantial losses are inflicted by the poultry diseases which are prevalent through the country, and much could be done to improve the position.

From the list of diseases I have mentioned it is obvious that I could not, in the time at my disposal, pass them under review, and I therefore propose to make a few observations upon the more important contagious affections which come under our notice. The contagious diseases I shall deal with are tuberculosis, bacillary white diarrhœa, fowl typhoid, fowl pox and coccidiosis.

(1) Avian Tuberculosis

From the statistics I have given it will be apparent that this disease is not uncommon, and our experience is that its frequency is on the increase. Last year more cases were observed among the dead birds examined than in any previous year.

As regards the percentage of fowls affected in each flock, our evidence is very fragmentary. That information is only likely to be forthcoming when the tuberculin test comes to be more generally applied. The following is the result of a recent test of three flocks:—

	Number tested	*Positive Reactions*	%	*No Reactions*
Flock A	54 hens, 40 pullets and 20 cockerels	14 hens and 1 pullet	16	40 hens and 39 pullets
Flock B	40 hens and 4 ducks	28 hens	70	12 hens and 4 ducks
Flock C	39 hens	1 hen	2·5	38 hens

Note.—In the case of ducks the tuberculin was injected into the web of the foot.

The actual losses by death seem to vary considerably in different infected flocks. In quite a number there was only an occasional death, while in others several birds had died at varying intervals and some were showing symptoms.

The history of Flock A was to the effect that the disease had existed for several years, that in 1931 eight hens had died from the disease and two in 1932.

In Flock B the numbers had been reduced from 140 to 40 hens within four or five months.

In Flock C only an occasional death had occurred. A surprising feature of Flock B was that the conditions under which it was kept were excellent. In a general way one usually associates the rapid spread of a contagious disease with the crowding together of large numbers of birds in a confined space, with want of cleanliness and with the continuous occupation of contaminated ground over long periods without any precautions. The debilitating effect of prolonged egg-laying also facilitates the advance of the disease in infected birds, and this is suggested by our experience that losses are more numerous in the first six months of the year.

But in addition to the losses among poultry, avian tuberculosis has an added importance in that it is transmissible to pigs and occasionally to horses, cattle, and even to man. Rabbits, rats and mice are susceptible. In Great Britain Eastwood, Griffiths and Cornell found avian tubercle bacilli in 75 cases out of 258 (29 per cent.) of localised tuberculosis in pigs; in Denmark, Christiansen in 86 out of 118 tuberculous pigs examined (*i.e.*, 72 per cent.), and in the U.S.A. Van Es and Martin found avian tubercle bacilli in 185 out of 209 (88 per cent.) glands from tuberculous pigs. It is not improbable that in this country pigs are frequently infected from tuberculous poultry.

Among birds we have found tuberculosis not

only in fowls but also in turkeys and ducks, in wild birds in captivity, and in one case in a thrush. It also has been observed in pigeons, guinea-fowl, pheasants and geese. Among fowls we have never seen the disease in chickens. That observation is opposed to the view that the infection is transmitted through the egg from tuberculous hens. The disease is observed almost entirely, if not invariably, in adult fowls and is more common in fowls at or over one year old, and it appears to increase in frequency with age.

Symptoms are only noted in the late stages of the disease, develop gradually and are not by any means characteristic. They consist of listlessness, loss of condition, the bird "going light," some anæmia, poor appetite and occasionally diarrhœa. Lameness is sometimes observed. Bumblefoot due to tuberculosis is rare and is not seen in more than ·2 per cent. of cases. In about 12 per cent. of our cases the fowls died suddenly from rupture of the liver, which had undergone fatty changes, and internal hæmorrhage and then often when in good condition, although tuberculous lesions were extensive.

Diagnosis of avian tuberculosis is only made from an examination of a dead bird or by the tuberculin test.

The Lesions met with indicate the alimentary origin of the infection. From 300 *post-mortem* examinations of tuberculous poultry the percentage frequency of the disease in different organs of the body is given below:—

Liver	88·6
Spleen	89
Intestines	77
Peritoneum	15
Lungs	10·6
Thymus	19·3
Bones	·6
Gizzard	1
Proventriculus	·3
Heart wall and pericardium ...	2·3
Kidney	1
Ovary	·3
Trachea	·3

Possibly bone and joint lesions are more common than indicated, in view of the frequency of lameness in affected birds. The lesions have the form of white to yellow-white firm tubercles, more or less round, and varying in size from a pinpoint to that of a bean or more. Some of the largest are found in the spleen and in the bowel wall, projecting on the serous surface. Occasionally, crater-like ulcers are noted singly or in numbers on the mucous membrane of the intestines and particularly in the cæca in the absence of any other changes. As indicating the alimentary origin of the infection, the liver and spleen are involved more than eight times as often as the lungs, and the latter are only affected in conjunction with some abdominal organs. The duck is an exception to this rule. In the liver and spleen the tubercles are almost invariably multiple. The larger tubercles are yellow and caseous in the centre.

To confirm the diagnosis, films may be prepared best from the caseous centres. There, the tubercle bacilli are usually present in abundance.

From the distribution of the tubercles and their tendency to caseate it is easy to distinguish tuberculosis from sarcomata and other tumours, and from chronic peritonitis with the formation of round granulations, which is so common in hens.

Eradication.—Once the presence of the disease is established, one of three plans may be adopted, according to circumstances, for the eradication of the disease.

First Method.—This consists in the destruction of affected and in-contact fowls, the disposal of the affected carcasses, the litter and droppings by fire or burial, and thorough disinfection of the house and utensils. The disinfection of the run is often a difficulty and frequently impracticable. It may sometimes be effected by the application of ground quicklime in the proportion of two tons to the acre. In any case, it is advisable to leave the run without poultry for at least six months. According to Schalk, in some soils the avian bacilli may remain viable for two years. The carcasses of the healthy in-contact fowls may be used for the table. This procedure is very drastic and can only be recommended when the stock is of small value and there is evidence of extensive infection of the flock.

Second Method.—This plan consists in the isolation of the adult birds in the affected flock or in the infected pen. Only fowls showing symptoms are destroyed, and this points to the frequent inspection of the flock or division for clinical symptoms. All chickens and young birds are kept apart on clean ground and in disinfected houses. Since the life of an ordinary fowl is not more than two or three years, the old affected birds will be got rid of in the course of a year or two, and if the isolation has been rigid and infected material has been properly disposed of, a new healthy flock will have been reared.

This method is useful when there are facilities for isolation and great attention is paid to cleanliness and disinfectant precautions. The eggs of the contaminated flock may be used for hatching, provided that the hens are showing no symptoms, because the danger of infection in this way is very small. One of the difficulties associated with this plan is that fresh ground is not available and the run to be used cannot be left vacant for a long period to allow any infection present to die out.

Third Method.—This plan entails the use of the tuberculin test and is gaining in favour. The tuberculin used is a concentrated avian

tuberculin. The dose injected is ·1 to ·2 of a c.c. and the injection is made into one of the wattles as near the surface of the skin as possible. The other wattle acts as a control. The syringe and needle employed for the intradermal test in cattle are quite suitable for this test. The fowls are inspected 48 hours after injection.

A positive reaction consists of a diffuse, tense swelling of the injected wattle, which is often completely involved and is more pendulous than the other.

When there is no reaction, no swelling, as a rule, or at best a small nodule is felt at or around the point of injection.

The test is a very reliable one, and in our small experience a reaction points to the invariable presence of infection. But in some advanced cases of the disease the swelling of the wattle is not so marked as in the lighter cases and occasionally may be overlooked or not develop.

On that account all birds reacting to the test and all those showing suspicious clinical symptoms must be taken as tuberculous and destroyed and disposed of by fire or burial. The non-reactors must be transferred to clean ground, but if that is not possible then the house, utensils and run must be cleansed and disinfected as far as practicable. Afterwards the flock should be retested at intervals of six months until it is free from tuberculosis.

To prevent the introduction or reintroduction of the disease adult birds should only be purchased subject to the tuberculin test, and rats and mice exterminated.

(2) Bacillary White Diarrhœa or Pullorum Disease

Bacillary white diarrhœa is world-wide in its distribution and is the most serious cause of loss among young chicks. In this country we first confirmed the presence of the disease in the early portion of 1924, when two outbreaks were discovered, but in all probability it was with us before that time. Since then the number of outbreaks detected annually have gradually increased until in 1931-32 there were 230 outbreaks.

The cause of the disease was discovered by Rettger in 1899, but it was not until the introduction and general use of incubators in the hatching of chicks that the disease and its control came to be seriously considered. And the reason is obvious. Whereas the number of chicks hatched out under a hen is small, those hatched out in incubators and kept in brooders number hundreds and even thousands and the losses from bacillary white diarrhœa increased accordingly.

Although the losses from this disease are most common in chicks, turkey chicks, pheasants, ducks, sparrows and crows have occasionally been found to be infected.

Transmission.—Bacillary white diarrhœa is largely introduced into a flock by eggs for hatching, day-old chicks and carrier fowls and also, to a much lesser extent, by contaminated food such as eggs, and on the boots and hands of attendants. A hatch of chicks most commonly contract the infection from one or more of their number which have been hatched out of infected eggs from carrier fowls. In the flock it is transmitted through contaminated food or water or ground from infected fæces of either diseased chicks or carrier fowls.

Symptoms.—The disease is usually suspected when chicks begin to die off in two or three days after hatching and deaths continue for two or three weeks. The symptoms are not always noted and are not characteristic. Some of the chicks have white diarrhœa and become pasted up behind. They appear drowsy, their abdomen is swollen, they peep constantly and their appetite is poor, but they are very thirsty. The losses among the hatch vary from 30 to 100 per cent. Some of the chicks may be dead in shell.

Diagnosis.—The diagnosis of bacillary white diarrhœa is only made under these circumstances in the laboratory by a *post-mortem* and bacteriological examination of the dead chicks. On *post-mortem* examination the changes that may be found include an enlarged light brown liver, with yellow-white specks through it, yellow-white nodules in the lungs, which may be congested, similar nodules also in the heart wall, occasionally in the gizzard and rarely in the wall of the bowel, and yellow-white firm casts in the cæca. In the younger chicks the chief lesion is that noted above for the liver. In older chickens one may find only a pericarditis. The only certain method of diagnosis, however, consists in the isolation in culture of the *Bacillus pullorum* from the tissues of the dead chick and its identification. The disease is a septicæmia and therefore the various tissues may be used for inoculation purposes. We usually inoculate agar from the liver, sometimes from the yolk sac or the nodules, and incubate at 37°C. for 24 hours. The colonies which appear are small, round and clear and the organisms are identified by their appearance in films, by their reactions in carbohydrate media and by agglutination tests with positive sera. The organisms are thus readily distinguished from streptococci, *Bacillus coli* and the *Bacillus sanguinarium.*

Preventive Measures.—It may be said, at once, that there is no cure for this disease. Therefore the removal of infection is the object to be aimed at.

When the diagnosis has been made, if the number of chicks in the hatch is small, the whole hatch should be destroyed; and all the dead chicks, their droppings and litter should

be disposed of by burning and the contaminated structures, incubators, hovers and brooders should be thoroughly disinfected. Ordinary disinfectants are efficient if thoroughly applied and if all the litter and material containing infected droppings have been previously scraped up and burned. It is recommended that the incubators be disinfected with formaldehyde gas evolved from a mixture of potassium permanganate and formalin in the proportion of 1·5 c.c. of the latter to 1 gramme of the former per cubic foot air space. The exposure need only be 15 minutes to one hour.

When the hatch is a large one, it may not be thought economic to kill off the whole of the chicks. A varying number may survive. Under these circumstances the survivors must be kept in strict isolation, with every attention to disinfection, and they should be fattened off as quickly as possible. On no account should they be kept as stock birds. The reason for this course is that quite a proportion of the survivors may become carriers.

Removal of Carriers.—Since these "carriers" are the common source of outbreaks among chickens, their detection and removal form the main plank in the campaign against bacillary white diarrhœa. And it is well to remember that a fowl can be infected at any period of its life but that the infection is usually only fatal when it occurs within a few days after hatching. Many infected fowls never show any symptoms. The laying powers of the hens may be depreciated and occasionally deaths may occur, with lesions similar to those of fowl typhoid. In the carrier hens the infection is largely retained in the ovary; but sometimes also in the spleen, the gall bladder, liver and kidneys, and the fæces are sometimes also infective. Cocks are sometimes also infected and the testes retain the infection. Carrier hens are chiefly dangerous because a proportion of the eggs laid are infected and the chickens, when hatched out, are affected with bacillary white diarrhœa. The proportion of infected eggs varies up to 20 per cent., the average being 4 or 5 per cent. Sometimes the hatches in the early portion of the season do well, while serious losses are suffered by the later hatches. In addition, pullorum disease is sometimes spread but slowly to some of the other fowls in the flock, and especially when cocks are kept with the hens. Although the carriers appear perfectly healthy, on *post-mortem* examination changes may be observed in the ovary. Some of the ova are shrunken, angular, hard and pedunculated, and vary in colour from brown to green.

Agglutination Test.—Fortunately a reliable test has been discovered for the detection of these carriers. The test now in common use is the agglutination test. Although very accurate, it is not specific. Positive reactions will be given not only by birds affected with pullorum disease, but also by those infected with fowl typhoid and the *Bacillus enteritidis gærtner*. That, however, is not a disadvantage. The method we adopt is the slow method and one tube is now being used for each test. Blood samples are got from each of the adult birds in a flock. The amount required for testing is 2 or 3 c.cs. The birds are fasted but allowed water for 12 to 24 hours before bleeding, to prevent opalescence in the serum, and the blood is drawn, after wiping the skin with methylated spirit, by puncturing the wing vein with a needle. The tubes used as containers must be sterile and must be labelled for identification purposes. The test must be performed as soon as possible afterwards, as specific agglutinins tend to disappear very rapidly, even in the course of two or three days, and most rapidly in the presence of putrefactive changes. The blood is allowed to clot and a small quantity of the serum is drawn off with a capillary pipette and mixed with a definite proportion of emulsion of a culture of the *Bacillus pullorum* in carbol normal saline solution. For expedition in carrying out the test, the North of Ireland modification of the Beaudette apparatus for pipetting the serum and a small syringe for distributing the emulsion are used. The tubes containing the mixture of serum and emulsion are incubated over night at 37°C. and the result read off the following day. A positive reaction is said to be given when agglutination takes place in a dilution of 1 of serum to 20 of emulsion, *i.e.*, when floccules appear in the mixture whether the latter becomes clear or not. A higher proportion of serum is required in the testing of cocks. The result of the test may be obscured if the serum is mixed with blood or is opaque.

The test is a valuable one, but not infallible. An infected bird will give no reaction for a short time after infection, for a period probably less than a month, and occasional infected birds will react at one time and not at another. A single test of a flock could not therefore be regarded as a sufficient guarantee that all reactors had been detected.

When the result of the test is made known the reactors should be eliminated from the flock, fattened and used for table purposes and attention paid to the disinfection of the house and run.

Afterwards the remainder of the flock must be retested after an interval of a month or more and at further periods until there are no reactors. A flock cannot be regarded as free from infection until no reactor appears when tested on two separate occasions.

Testing should only be carried out when the birds are at or near the period of reproduction.

It is possible that some birds get rid of infection after a time, but it is not economic to take that into account when considering eradication.

The test is now in operation on a large scale in various countries. Last year at the College over 50,000 birds were tested, and it is expected that that number will be greatly exceeded this year. Last year it was observed that out of over 1,000 flocks tested half that number gave no reactions and were presumably free from infection. In the remaining flocks a varying proportion reacted, and in a few the majority were reactors. The average percentage of reactors was 5·7 as compared with 10 in the previous year.

The numbers tested are small when one thinks of the total poultry population, but they make a good beginning, and through these tests many flocks can be relied on to supply eggs and chicks free from infection.

Our experience in this connection has been that no outbreak of bacillary white diarrhœa in chicks has been traced to flocks which have had no reactors when tested on two consecutive occasions, and the opinion of many poultry owners is that this method of eradication is well worth the trouble and expense.

To prevent the introduction of the disease into a flock, fowls should only be bought subject to the test and eggs for hatching and chicks should only be obtained from flocks which are known to be free from infection.

Owing to the space given to the above two diseases, I can now deal only very briefly with the other three affections.

(3) Fowl Typhoid

Fowl typhoid is a contagious disease of poultry which has been confused with fowl cholera, a disease which has not been encountered in this country for many years. It is not uncommon and has been seen in most of the counties in the Saorstat. From 15 to 25 outbreaks are confirmed annually. Fowl typhoid was first shown by Klein in 1886 to be due to a special bacillus, the *Bacillus gallinarum* or *sanguinarium*, and it has further been shown that this organism closely resembles the *Bacillus pullorum*, from which it is chiefly distinguished when grown on carbohydrate media by the absence of gas production and the acid reaction in maltose and dulcite. Clinically the differences are marked in that the serious losses inflicted by fowl typhoid occur among adult birds, and chicks are seldom affected. Although the organism has been found in the ovary, the disease is not as a rule transmissible through the egg.

Transmission.—This disease is commonly introduced into a flock by carrier fowls, by infected materials or through streams or ponds into which dead birds or their excreta have been thrown and it is often associated with insanitary conditions.

The usual symptoms shown are drowsiness, loss of appetite, comb and wattles either dark red or light in colour, and diarrhœa, which is greenish-yellow and stinking. The symptoms are often not observed and are not characteristic. Death occurs in one, two or three days or later. Some light cases recover and carriers are frequently noted. The mortality in a flock varies from 20 to 80 per cent. and the transmission may occur rapidly or slowly.

Diagnosis.—Diagnosis is only made in the laboratory from examination of a fowl which has died. The chief changes to be observed are an enlarged bronze coloured or dirty greenish-brown liver, enlarged spleen, a variable amount of enteritis, some petechiæ under the epicardium and some œdema of the lungs. These changes are only suspicious. The recognition of the disease is only made by a bacteriological examination made in much the same way as for bacillary white diarrhœa in chickens. The disease is a septicæmia. Cultures are readily obtained from the liver or bone marrow.

Prevention.—There is no reliable curative treatment. Preventive measures comprise:—

(*a*) The blood testing of the remaining birds and the elimination of the reactors. The reactors may be used for the table.

(*b*) The disposal of dead birds, their droppings and litter by burning or burial.

(*c*) Thorough disinfection of the house and utensils and the application of quicklime to the runs.

(*d*) The provision of an uncontaminated water supply.

(*e*) Vaccination where the above measures cannot be satisfactorily carried out and the disease recurs.

(4) Fowl Pox

Fowl pox is a very common contagious disease of adult fowls and often causes heavy losses. It probably does not come to our notice so often because it is recognised without reference to a laboratory examination. The disease chiefly affects fowls, pigeons and turkeys, and these are the only birds in which we have seen the disease in this country.

It has been shown to be due to a filterable virus, of which there are apparently two strains: that of fowl pox and that of pigeon pox. The virus is present in the lesions and in a limited way the blood is virulent. The virus of pigeon pox sets up a mild form of the disease in fowls.

The period of incubation varies from three to twelve days.

Transmission.—The disease is transmitted by direct contact with infected birds and infection is facilitated by small wounds about the head. It may also be contracted by putting poultry on contaminated ground. There are apparently no carriers in this affection.

Symptoms.—There are three clinical manifestations of the affection, which may be combined:—

(1) *Comb Lesions.*—In this form wart-like

nodules develop on the comb, wattles, eye-lids and near the auditory openings; rarely elsewhere. The nodules are firm and rough, at first yellow and later brown in colour, varying up to a quarter-of-an-inch in size. They may be discrete or coalescent. If the lesions are confined to these areas, the bird will recover in two or three weeks.

(2) *Mouth Lesions.*—Here yellow-white, firm, false membranes are formed in some part of the mouth or pharynx. They usually increase in extent or depth and interfere with feeding and swallowing. This form is very frequently fatal. Sometimes these membranes develop in the larynx and cause sudden death by asphyxia. These form the sort of cases sent to us for diagnosis.

(3) *Oculo-nasal Form.*—In this form there is usually a discharge from the nostrils, which is at first watery and later thick and purulent. In addition, the eyelids become swollen and the eyes closed and there appears a good deal of viscid discharge in the conjunctival sac. Sometimes the orbital sinus below the eye becomes distended with a glairy or yellow, thick exudate. This is not uncommon in turkeys. This form is readily distinguished from contagious catarrh because of the combination of the lesions or the appearance of the other forms of fowl pox in other members of the flock. If a bird recovers it has a high degree of immunity.

Treatment.—When the disease appears, all the birds in the flock should be examined and the affected birds removed. If the number is small, the spread of the disease may be checked in this way and by disinfectant precautions. The treatment of sick birds is not economic, is often prolonged and unsatisfactory, and they ought to be destroyed, burnt or buried in quicklime. Where the disease is not checked resort should be made to vaccination as soon as possible. The vaccine used is the pigeon pox virus contained in the crusts of the epithelial nodules and made up into an emulsion with glycerine. About half-a-dozen feathers are plucked from the front of the leg and a small area lightly abraded with a scarifier. Over this the vaccine is smeared. A local swelling and scab develop and a solid immunity is set up in the course of 14 days. It lasts for about six months.

This vaccine has given very satisfactory results. The introduction of fowl pox into a flock may be avoided by isolating newly-purchased birds for about a month and frequently inspecting them for any symptoms.

(5) Coccidiosis in Poultry

Coccidiosis in poultry approaches bacillary white diarrhœa in its frequency, but its position is even more unsatisfactory on account of the absence of efficient methods of control of carriers. It is common through the country and affects not only fowls, but turkeys, peacocks and pheasants, and we have seen it also in ducks.

It is observed throughout the year, but it most commonly causes chicken mortality between the months of April and July.

The disease is due to species of coccidia which are not transmissible to rabbits or other mammals. According to Tyzzer, there are four species which attack poultry, and of these *Eimeria tenella* is the one which infects the cæca. The disease is essentially one affecting the intestines, in which the coccidia invade the intestinal epithelium at certain points. The coccidia are commonly discharged in the fæces in the form of oöcysts, which are extremely resistant to external influences or disinfectants. They are destroyed by dessication and putrefaction in two or three weeks. The fæces are the source of infection. Among chickens the disease often takes the acute form and the birds affected vary in age from two or three weeks to two or three months. We have, however, seen chickens infected as early as seven or nine days. Deaths begin to appear at a later stage than with bacillary white diarrhœa.

The symptoms usually noted are dulness and listlessness, reduced appetite, greyish-white diarrhœa and frequently blood-stained droppings. Death is very rapid and 75 per cent. or more of the chicks may succumb to the infection. Survivors may remain carriers.

Diagnosis is made usually from examination of a dead chick. The carcass is often anæmic, the cæca are enlarged, the walls are bluish-red in colour or spotted red, and the contents consist largely of blood or are greyish-yellow and soft. A microscopic examination is necessary to make the diagnosis. Films of the cæcal contents are mixed with a little water and examined under the microscope with a moderate magnification. One can readily recognise the small egg-like oöcysts or other developmental stages of the coccidia in such smears.

Chronic forms of coccidiosis are not infrequently noted in older birds and sometimes cause wasting and debility. Here again, the diagnosis depends on the identification of the coccidia in scrapings from some part of the bowel.

Treatment.—Curative treatment is often not sound policy, because carriers may be allowed to remain in the flock. It may be cheaper to kill off survivors. These survivors are often treated with catechu, colloidal iodine or hydrochloric acid, with varying results. Milk is also recommended.

In any case: (1) all dead birds should be disposed of by fire, together with their droppings and litter; (2) the house should be cleaned out and disinfected with a blow lamp and the utensils with boiling water; (3) the run requires careful attention. The grass, if

any, should be cut short and the land heavily dressed with quicklime, which may hasten desiccation.

The great difficulty is the carriers. To avoid infection from the adult birds, chicks should be reared in special sections not used by the older fowls.

. . . . .

That completes a survey, admittedly inadequate, of some of the contagious diseases of poultry met with in this country.

From what has been stated it is obvious that their diagnoses require, for the most part, laboratory facilities. That, however, does not apply to fowl pox, tuberculosis or coccidiosis. For diagnosis of the latter, at least, a microscope is required. Bacillary white diarrhœa and fowl typhoid can only definitely be diagnosed by the identification of the causal organisms. It may, however, be claimed that in the field much might be done by the veterinary practitioner to assist the poultry industry in the management and control of disease. And, in particular, it might be added that tuberculin testing of poultry is being called for on a fair and increasing scale and I think it is in the interests of the profession and for the better control of avian tuberculosis that the testing should be kept in the hands of the veterinary practitioners.

In conclusion, I may be permitted to draw attention to the fact that, under a recent Act, poultry have been definitely placed within the purview of the Diseases of Animals Acts and that at least in a limited way some of the contagious diseases of poultry may be included in the schedule of notifiable diseases.

Discussion

Mr. P. J. Howard expressed regret at having to leave to keep an appointment before hearing Mr. Lamont's remarks and said that he would like to impress upon the profession the importance of the subject introduced by Professor Craig.

Mr. H. G. Lamont, M.R.C.V.S., M.Sc., Belfast, in opening the discussion, said:—

I appreciate very much indeed the honour of being asked to open the discussion on Professor Craig's paper, particularly so as my first knowledge of poultry diseases was acquired under his able guidance and that of the late Professor Kehoe.

I have read his paper with great interest and profit, and if I may be permitted to express an opinion, may I say that it will prove of great value to the profession, not only in Ireland, but in England and Scotland.

Professor Craig has indicated the magnitude of the problem. He has given concisely a description of the salient features of some of the more important diseases with which a practitioner is likely to come in contact, and has described lucidly how to apply the tuberculin test to poultry. I should advise every practitioner to read this description of the method very carefully.

Before dealing with the subject matter of the paper proper, I should like to refer to Professor Craig's statement that "the study of poultry diseases is a department of veterinary work which has not attracted the general practitioner in the country, in view of the small value of individual birds, but it can be claimed that, if that interest were aroused, a very valuable contribution could be made, by the profession, to the prosperity of the poultry industry." I should like to say that I am in very cordial agreement with the latter part of this statement.

Personally I do not think that practitioners will earn many fees from poultry practice. Logically the practitioner is the man whom the poultry farmer should consult when an outbreak of disease occurs among his birds, but in actual practice this is the exception rather than the rule. The reason for this state of affairs is not far to seek. I have met practitioners who do not mind admitting that they know simply nothing about poultry diseases and do not encourage poultry farmers to consult them. This is partly due to the fact that it is only of late years that poultry diseases have featured in the college curriculum, but it is also largely due to the queston of £ s. d. Many practitioners are reluctant to arm themselves with knowledge which is not likely to prove remunerative. To them a hen is a hen, worth 2s. 6d. or 3s., and they see no hope of ever getting a fee from attending such insignificant animals. I know also, from actual experience, that where a veterinary surgeon has been consulted about deaths of hens or chicks, too often the advice has been "parcel one up and send it to the laboratory." The natural result of this state of affairs is that the poultry farmer does not look to his veterinary surgeon for advice and once the knowledge gets abroad that there is a laboratory which he can consult and where *post-mortem* examinations are made for a small fee, naturally he will go there every time.

This is the trend of poultry practice in Great Britain and Ireland, and while, as Professor Craig has indicated, most poultry diseases require laboratory facilities for their diagnosis, it is a matter for regret that our specimens do not come through the local practitioners.

Apart, however, from the question of remuneration, surely we should have some pride in the work of our profession. I do think it is up to every practitioner to polish up his knowledge of poultry disease; it will improve his standing with the farmer in other directions. An actual experience of my own was where I recommended a farmer to have a flock of turkeys inoculated with myosalvarsan as a treatment for black head, and referred him to his local veterinary surgeon—who said he knew nothing about it. The local doctor thought it was a "leg pull." Eventually the local poultry instructress carried out the inoculation, and I understand that this instructress has inoculated some 15 flocks in her district since this incident, which occurred about six weeks ago. At least one would expect a veterinary surgeon to know as much about poultry diseases as the local poultry instructress who has not had the benefit of a professional training.

It is a matter for congratulation that the laboratories in this Island which deal with poultry diseases are under veterinary control, and, while I cannot speak for the Saorstat, I can say that in Northern Ireland poultry diseases are under veterinary control.

The figures which Professor Craig has given are so interesting that for the purposes of comparison I have endeavoured to get corresponding ones

for Northern Ireland. In 1918, there were 5,771,886 head of poultry in Northern Ireland, including fowls, ducks, geese and turkeys. In 1925 there were 6,733,125 head of poultry, and in 1933 there were 10,149,976. As a matter of fact, the number of poultry per 100 acres is greater in Northern Ireland than in England, Wales, Scotland, or the Saorstat Eireann. The actual figures for Northern Ireland are 354, England and Wales 222, Scotland 150, and Saorstat Eireann 193. The value of poultry products in 1930 in Northern Ireland was given as £3,616,800. For 1933, I think one would be quite safe in estimating it as in the region of £4,000,000.

This enormous expansion of the industry has brought its own problems, and chief of these is the disease question. As Professor Craig indicates, modern methods of mass production are primarily responsible for this state of affairs. I do not quarrel with methods of mass production, they are essential to the industry; it is the manner in which they are applied that is at fault.

In the Veterinary Research Laboratory, Belfast, the following contagious diseases were encountered during the report year 1932-33; bacillary white diarrhœa, coccidiosis in chickens, coccidiosis in adult fowl, tuberculosis, fowl typhoid, fowl pox, black head in turkeys, aspergillosis and worm infestations, including "gapes." You will note that I include worms under the heading of contagious disease.

In one outbreak of aspergillosis involving about 600 goslings, some 400 died.

Outbreaks of contagious disease represented about one-third of the total number of specimens dealt with. This figure, I understand, agrees closely with that found by Professor Craig.

Regarding other diseases encountered, no reference is made to fowl paralysis. In my own rather limited personal experience, I have always found affected birds to be heavily infested with intestinal parasites, including oöcysts and various species of worms.

I know that Professor Craig is seriously limited as regards time, but I should like to have heard his views on this problem.

Ovarian troubles, including peritonitis (inflammation of the oviduct) accounted for a considerable number of specimens.

Birds affected with the following conditions were examined: rickets, pneumonia and congestion of the lungs in chickens, crop bound and other impactions, enteritis (no ascertainable cause), arsenical poisoning (weed-killer), phosphorous poisoning, salt poisoning, gout in adult birds, gout in day-old chicks, bronchitis and pneumonia in adult fowl, rupture of the intestines, fatty degeneration (often with ruptured liver), and tumours.

In about 7 per cent. of the specimens examined we were unable to detect any evidence of disease.

In connection with these rather monotonous details I should like to make the following comments:—

Tuberculosis is by no means a serious problem in Northern Ireland. The system of poultry husbandry adopted is largely responsible for this; birds are seldom retained beyond their second year, and this factor automatically tends to limit infection. We have had quite an extensive outbreak of this disease among ducks, with 70 per cent. mortality. To Professor Craig's interesting list of birds affected we can add a demoiselle crane and a peacock. In passing, it should be mentioned that lung lesions were present in the ducks and in the crane and peacock.

With regard to bacillary white diarrhœa, we have had experience of two serious outbreaks of this disease in adult fowl, with heavy mortality. The symptoms were suggestive of fowl typhoid, but the organism recovered from the livers and bone marrows proved to be *B. pullorum*. In April of this year we isolated *B. pullorum* from the testes of a cockerel which had reacted to the agglutination test.

Regarding the blood test or agglutination test, we can confirm all that Professor Craig has said. The results in practice are excellent, and each year more and more owners are clamouring to have their flocks tested. To show the growth of testing in Northern Ireland, I give the following figures: In 1927-28, 3,476 blood samples were submitted; in 1932-33 this number had increased to 121,651 from approximately 1,000 farms. As a result of regular and repeated blood testing we are now in a position to issue a list of accredited farms where one can buy eggs with a real assurance of safety. As an afterthought, I may mention that an outbreak of bacillary white diarrhœa in turkey chicks was encountered during the year.

Fowl typhoid is not a serious disease in Northern Ireland. We have had excellent results with vaccination, using a heat-killed culture of the organism, or perhaps the improved methods of sanitation introduced brought about the favourable results. We are of the opinion that the disease is associated with insanitary conditions. We have had an outbreak of this disease in pheasants.

Fowl pox is a very widespread disease. The methods given in this paper will definitely eradicate it. Several outbreaks in young turkey poults were recorded; In these skin lesions were invariably met with.

Professor Craig has left coccidiosis to the last, but I think one is safe in saying that coccidiosis, including the adult and chicken type, and worm infestation, are among the greatest problems confronting the poultry industry. Owing to lack of time, Professor Craig has made little reference to the adult type of coccidiosis. In chickens the cæcal type of disease predominates, but in adults one finds the duodenal type most common. In adults associated symptoms appear to be wasting, blindness and various types of paralysis. There are no satisfactory treatments for these conditions and in any measure of control the importance of clean ground must be emphasised. No sensible farmer would dream of producing oats or potatoes for two, three or four successive years on the same ground, and yet he will continue to raise poultry on the same run season after season, until disease compels him to make a change. The salvation of the poultry industry lies in the provision of clean, fresh ground for each season's rearing. In other words, poultry should be regarded as a crop, and managed under a system of crop rotation. Chicks should never follow adult fowl. In fact, there would be less parasitic disease generally in all types of farm stock if fresh ground were provided for their young.

In referring to coccidiosis, as an item of interest I may mention that we have met with an outbreak of this disease in goslings and in this outbreak the oöcysts had invaded the kidneys and were present in great numbers in these organs.

In conclusion, I should like to refer briefly to fowl cholera. We have had two outbreaks of this disease within the last three months, and the first in my experience.

The first outbreak occurred in a flock of 50 hens imported from Norfolk. They were bought by a young would-be poultry farmer whose eye

was taken by a well-worded advertisement. Actually the vendor was a fowl dealer who bought birds here, there, and everywhere. Forty birds were delivered to the purchaser on September 6th, a further nine were delivered on September 13th (there should have been ten, but one had disappeared in transit). On the 14th, there were two deaths, and within the ensuing 14 days, nine further deaths occurred. As the majority of the birds looked affected, the owner arrived at the laboratory with a dead specimen. On *post-mortem* examination, the usual findings of a septicæmic disease were found. The appearance of the liver was suggestive of fowl typhoid. The characteristic feature, however, was the appearance of the lungs. These appeared to be the seat of a hæmorrhagic pneumonia. Blood smears showed the presence of enormous numbers of small bipolar staining organisms. These were extremely pathogenic for rabbits, a small drop of heart blood on subcutaneous injection causing death in twelve hours. On the surface of trypsin agar slopes growth appeared in the form of delicate translucent colonies.

Steps taken to clear up the outbreak consisted in the destruction of all the birds, burying deeply in quicklime, and thorough disinfection of the premises.

The second outbreak occurred in a flock of turkeys. There were 43 turkeys in this flock. Twenty of them were sold to the fowl man, and four or five days later one of the remaining 23 died. The following day five died, five the next day, which was Sunday, and five on the Monday, when the owner consulted the laboratory. The owner suspected malicious poisoning. *Post-mortem* examination showed a very light-yellowish coloured liver, suggestive of degenerative changes such as acute yellow atrophy. The body cavity contained a blood-stained effusion. There was evidence of acute enteritis.

Again the characteristic feature was the condition of the lungs. These were almost coal black in colour, and consolidated; fibrinous deposits were present on the surface. Numerous hæmorrhages were present under the epicardium, particularly at the junction of the auricles with the ventricles.

Blood smears showed numerous bipolar organisms, extremely pathogenic for rabbits. An aged hen which was inoculated with a tiny drop of heart blood became very dull and sleepy and remained in a moribund condition for five days, when she died. Blood smears showed numerous bipolars. The characteristic pneumonia was not present in her lungs; these had a peculiar dry rubbery appearance.

The characteristic pneumonia was present in any of the turkeys examined; in all, 21 out of 23 turkeys died. We were unable to trace the source of infection. Fortunately the turkeys were isolated from any other domestic fowl. The symptoms described by the owner were dulness and a sleepy appearance. In the later stages, the birds were gasping and a blood-stained froth poured through the beak and nostrils. An offensive diarrhœa was present.

I am afraid I have taken up a great deal of time. I should like to have dealt with our blood testing scheme, which is the pioneer one in Great Britain and Ireland, but I have already exceeded the time allowed to openers of discussions.

The Chairman (Mr. O'Dea) said it was very kind of Mr. Lamont to come from Belfast to open the discussion on Professor Craig's paper, and that he had done so in a very able manner. He asked the members to continue the discussion.

Professor T. G. Browne, in complimenting Professor Craig on his paper, said that at a Council meeting early in the year he suggested that Professor Craig be asked to provide a paper on "Poultry Diseases" for one of the forthcoming meetings, and he thought that every one present would agree with him that that suggestion had had a very excellent result, not only from the point of view of the paper but also from the point of view of the opening of the discussion. This was the first occasion on which that Association had had a paper on poultry diseases, due to the fact that it had only been within recent years that the study of poultry diseases had been taken up seriously. Not many years ago the poultry industry was not considered of sufficient importance to justify intensive research work on poultry diseases, but within the past few years that industry had made enormous strides in many countries of the world and particularly in that country, and it was interesting to note there that, in regard to poultry, Ireland held two world records. In the Irish Free State there was a greater number of poultry in proportion to the human population than in any other country in the world, and in Northern Ireland there was a greater number of poultry per acre of arable land than in any other country in the world. In view of these records, how fitting it was that night that those two parts of the world should join together for at least one evening to discuss poultry diseases.

Some veterinary practitioners seemed to consider poultry diseases of no importance and rather beneath them, but when one considered the enormous losses which the country sustained annually through outbreaks of contagious diseases in poultry, it would certainly be well worth the practitioners' while to make themselves acquainted with these diseases so that they would be able to advise and assist in the eradication of the large outbreaks which occurred. Every practitioner should be capable of carrying out the tuberculin test on poultry, as this test was now rapidly coming into vogue, and if the veterinary surgeon did not take it up in the near future someone else would do so. Whether or not the veterinary practitioner concerned himself with tuberculosis in poultry, he was, at least, indirectly concerned with the disease, because avian tuberculosis had a very important bearing on the eradication of tuberculosis in the other domesticated animals. It was now well known that avian tuberculosis commonly affected pigs, less frequently cattle and occasionally the horse, sheep and some other animals. It had also been recorded in man and although by no means common, it was well to be aware that it might be a source of danger to the human. Avian tuberculosis in pigs was now of considerable importance owing to the rigorous system of inspection which had been introduced in bacon factories, and here was an instance where the veterinary practitioner might be of assistance where the farmer was puzzled about tuberculosis in his pigs, since by examining the poultry on the farm he might discover that the source of the trouble had been tuberculous fowl. It was interesting to note that in the U.S.A. it was found that the percentage af avian tuberculosis in pigs in the different countries varied according to the percentage of tuberculosis in the poultry in the respective counties.

Tuberculosis of avian origin in cattle had been recorded in many countries. Dr. Minett, of London, stated, as a result of his experience in investigating Johne's disease, that he believed

that avian tuberculosis in cattle was much more common in England than was generally believed, and in the course of his investigations on three herds he recorded five cases of avian infection which were confirmed on *post-mortem* examination. Van Es and Martin, in the United States of America, investigated isolated tuberculous lesions in the mesenteric glands of cattle and recognised the type of infection in 115 carcasses and found that eleven were of avian origin, four mixed (avian and mammalian) and 100 mammalian. Plum, in Denmark, described six cases of abortion in cattle where the uterus and placenta were affected with tuberculosis of avian origin. These were merely a few of the recorded cases of avian infection in cattle.

The lesions of avian infection in cattle were not progressive, being localised, usually in the mesenteric glands, but it was important to remember that frequently no lesions at all could be found, although the animals were infected and might react to tuberculin, the animal being merely sensitised to tuberculin by the presence of the infection in its system. It had been demonstrated by Plum, Schalk, Marsh and others that a large proportion of the cattle which were infected with avian tuberculosis would react to ordinary mammalian tuberculin. That gave rise to a very important issue in regard to the tuberculin testing of cattle, and it might possibly explain at least some of the cases of non-lesion reactors. It was, therefore, the duty of the practitioner, when carrying out the tuberculin test on cattle, to see that the animals had not been in contact with tuberculous fowls, and to see that the poultry on the farm was free from tuberculosis. However, it had been demonstrated by several workers that most cattle which were infected with avian tuberculosis would cease to react to tuberculin within a year after being removed from the source of infection.

Johne's disease was another condition on which avian tuberculosis had an important bearing, since the diagnosis of that condition by johnin would be complicated, in as much as cattle infected with avian tuberculosis would also react to johnin. Fortunately, we were not much troubled with Johne's disease in this country, but we never knew how soon we might be since it had become very prevalent in England within the past few years.

It had been recently recorded by Wolters and Dehmel that cows which were infected with avian tuberculosis might occasionally discharge avian tubercle bacilli in their milk. Although that might not be of great importance from the public health point of view, it might, nevertheless, lead to errors in investigating the origin of acid-fast bacilli in milk.

It had been recorded that fowl might occasionally become infected with tuberculosis of human and bovine origin, but we had no evidence which would go to show that this was of frequent occurrence. According to recent experiments carried out in U.S.A. by Feldman, where he inoculated three lots of fowl with human, bovine and avian strains of infection respectively, it was found that 50 per cent. of the two lots inoculated with the two mammalian strains reacted to avian tuberculin, but none of those birds revealed tuberculous lesions on *post-mortem* examination. Of those inoculated with the avian strain, 50 per cent. reacted to mammalian tuberculin as well as to avian tuberculin. It must be kept in mind, however, that in these experiments the birds were inoculated with the infection, so that they were not conclusive proof that cross reactions to tuberculin would occur in cases of natural infection. Nevertheless, those experiments were suggestive and should be kept in mind when testing poultry which were in contact with tuberculous cattle or tuberculous human beings.

There was urgent need for legislation in regard to contagious diseases of poultry, for in cases of large outbreaks there was nothing to prevent the in-contact birds from being sent to the market with the result that the disease might be disseminated far and wide, and in outbreaks of bacillary white diarrhœa the infected eggs might be sold for hatching, so that the disease was thus carried to clean farms. Furthermore, there was no legislation controlling slaughterhouses for poultry, so that birds might be slaughtered in all sorts of places and in all sorts of conditions, and there was nothing to prevent diseased birds, or even birds dead of disease, from being prepared for human food. It was not contended that the human was likely to contract serious illness from the consumption of diseased poultry, but the public was entitled to some guarantee that the food it consumed and paid for was wholesome and pure. In the United States of America new regulations were issued in 1928 governing the inspection of dressed poultry on somewhat similar lines to those governing ordinary meat inspection.

It was interesting to note here that cases had recently been recorded by Dalling and Warrack of disease in chickens and young ducks caused by the same type of organism as those which caused food poisoning in man, namely, the *Bacillus ærtrycke* and the *Bacillus enteriditis of gærtner*. Furthermore, those organisms have also been found in fresh ducks' eggs and numbers of cases of food poisoning in man had been recorded as a result of the consumption of such eggs.

Mr. J. H. Norris said he had not been in sufficiently close contact with poultry diseases to add anything of value to the discussion. He felt, however, that in the near future poultry diseases would probably be controlled by Order under the Diseases of Animals Act. He considered that any Order made would require to be less widely drawn than similar Orders for the control of contagious diseases in the larger domestic animals, and he did not think that local veterinary inspectors would have much scope for action in this connection. He considered that the rôle of the veterinary surgeon would continue to be largely that of the private practitioner—advising owners as to the prevention and treatment of the more important poultry diseases. He was surprised at the amount of successful research work that had been done at the Dublin Veterinary College, and other veterinary institutions in Northern Ireland and Great Britain during recent years, although, of course, much still remained to be done. Tuberculosis in poultry was not only important to the poultry industry, but was also an important disease of swine, and, to some extent, other animals. Mr. Timoney had recently examined, in the Department's Laboratory, a number of tuberculous glands from swine, with the object of ascertaining the type of tuberculosis present, and found that about one-third of the cases were avian tuberculosis.

Professor W. Kearney observed that it was too late in the evening to enter into a discussion of the technical aspects of the paper, but there was just one point to which he would like to draw attention, namely, the confusion which still existed regarding the relationship of intestinal parasites, including coccidia, to paralysis in

poultry. In his experience, parasites, particularly tapeworms and coccidia, were responsible for considerable losses among poultry both in adults as well as in young birds, and that paralysis was often a feature of the condition. He was still to be convinced that these parasites were not responsible, either alone or in conjunction with some other factor, for a large number of cases of so-called fowl paralysis. It would be well for those engaged on experiments into the ætiology of fowl paralysis, to endeavour to define more clearly the differential features of the symptoms and lesions of the alleged virus disease, and those which appeared in birds suffering from parasitism.

There was, he said, an aspect of this subject which should be seriously considered by this Association, and that was the attitude the profession should adopt in suppressing poultry diseases. The public looked upon them as the only people qualified to deal with this matter, and yet with the exception of the diagnosis work carried out at that College, and the advice given from there to individual enquiries, we were doing nothing. That was not enough. Some scheme should be inaugurated whereby the profession or some branch of it should be capable of dealing efficiently with the control of the disease, and he suggested that a committee of the Association should be appointed to consider the matter and draw up proposals to be submitted to the right Authority.

Mr. J. D. Whitty congratulated both Professor Craig and Mr. Lamont upon their interesting and instructive contributions on the very important subject of diseases of poultry. He had been a poultry fancier for years, and he would like to sound an optimistic note as to the prospect of the veterinary surgeon in dealing with those diseases. Owners of valuable poultry would be quite willing to pay an adequate fee to a veterinary surgeon for skilled advice. It was essential that the veterinary surgeon should know all about poultry to secure the confidence of the poultry breeder. He would have liked to have heard more about fowl parasites and paralysis, but was aware that the compass of the paper did not allow of too much detail. People required advice about such matters as the danger of buying birds or eggs from outside stocks, the importance of quarantining of birds returning from laying tests or shows, the eradication of disease when introduced and prevention of its recurrence. Strict precautions were necessary to keep out infection from flocks. Strangers visiting the premises might introduce disease. He was very strongly opposed to lay instructors or instructresses inoculating or testing poultry, *e.g.*, testing with tuberculin, injecting with neosalvarsan, etc., operations which should be done only by the veterinary surgeon, who should keep himself informed of the advances in the knowledge of poultry diseases.

Mr. L. M. Magee confessed that he knew very little about diseases of poultry, and said that it was difficult for the practitioner to acquire the necessary proficiency in the subject. He believed the only solution of the problem was the appointment by the Government of veterinary surgeons who had undergone a special training in poultry diseases to give advice thereon throughout the country, appointing say, one such specialist for each county. A nominal sum might be charged to help to defray the cost of the scheme. He thanked Professor Craig very much for his excellent paper, and was delighted to see Mr. Lamont there for the first time. He thought the attendance at the meeting should be better, considering the eminence of the reader of the paper, and the importance of the subject dealt with.

Mr. P. F. Dolan congratulated Professor Craig on his paper, demonstrations and slides, and also Mr. Lamont on his very interesting and instructive contribution to the subject. In his experience, "gapes" was a very common condition, and he would like to have the views of Professor Craig as to its prevalence. The transmission of avian tuberculosis to pigs was an important matter. It was stated that 30 per cent. of the cases of tuberculosis in pigs were of the avian type. Farmers did not realise the prevalence of tuberculosis in pigs; it was only seen at the bacon factory. The presence of avian tubercle bacilli in cattle might be a serious trouble in the maintenance of tubercle-free herds as long as poultry were allowed to mix with the cows of such a herd. The moral was to keep poultry away from pigs and cattle. He wished to extend a hearty welcome to Mr. Lamont, and he hoped that his visit would be the beginning of a closer co-operation between the North of Ireland Association and that Association.

Mr. O'Donovan said it was evident, from what had transpired that evening, that the Government of Northern Ireland afforded greater facilities for veterinary research than that of the Free State. He appealed for the further development of veterinary research and publicity for the result of the work accomplished.

At a meeting in Limerick some years ago, a resolution was passed demanding that the Government should institute research into tuberculosis as affecting pigs. He was astonished to learn that only 23 specimens of tuberculosis in pigs were examined at the laboratory of the Department during the year. He would like to know if any carcass of a pig that was totally condemned for tuberculosis was affected with the avian type of the disease. His opinion was that a carcass was never completely condemned for avian tuberculosis, and that the generalised cases were always of bovine origin, but he had no proof of this. Avian tuberculosis affecting cattle had a bearing on the testing of tubercle-free herds.

The necessity of research was evident in many other directions as well as in poultry diseases. Bovine mastitis, for example, was in need of more investigation. Publicity was wanted in connection with the need of research into animal diseases. He complimented Professor Craig on his paper and for the publicity he gave to the subject. He hoped that a further stimulus would be given to veterinary research.

Mr. E. W. Little thanked Professor Craig and Mr. Lamont for their very instructive and interesting contributions on poultry diseases. It was a very happy idea to bring Mr. Lamont from the North of Ireland Association to take part in that meeting, and he hoped that on some future occasion they would have a conjoint meeting of the two Associations.

He had heard complaints about disease being disseminated through eggs obtained from egg departments in the country. If this were so it was a serious matter and required attention.

Mr. A. F. O'Dea thanked Professor Craig for his excellent paper. He would have liked to have heard more about fowl paralysis and also to have had the question of avian tuberculosis in the human subject further elucidated by Professor Craig. He had read of avian tuberculosis affecting a child's kidney as the result of eating raw eggs. If this were so, one would expect the birds to be affected at six months old, which was contrary to what Professor Craig had told them.

He was sure he was voicing the feeling of all

members present when he proposed a cordial vote of thanks both to Professor Craig and Mr. Lamont for their kindness in providing such excellent material for the meeting. The proposal was passed with acclamation.

The Reply

Professor Craig, in reply, said that he wished, in the first place, to ensure that credit was given where it was due. The whole of the poultry disease work at the College was not, and could not be, carried out by one individual, and he was happy in having the loyal co-operation of his colleagues, Professor Kearney and Mr. Pierse. Professor Kearney did as much of the work as he did, and Mr. Pierse did most of the agglutination tests for bacillary white diarrhœa.

The happy thought of inviting Mr. Lamont to open the discussion on the paper first entered his mind when he was asked to nominate someone for the purpose. He knew that Mr. Lamont had had a great deal of experience, and had interested himself for a long time in poultry diseases, and the manner in which he opened the discussion more than justified the selection. His contribution was in reality an expression of his views and observations gained in the course of his work, and was, therefore, of the greatest value.

Professor Craig was well aware of the facilities which were provided in the North of Ireland for the study and the control of poultry diseases, and greatly admired the organisation that had been built up to assist the poultry industry in dealing with the serious disease problem with which the industry was faced.

The two outbreaks of fowl cholera described as recently occurring in the North of Ireland were of special interest as indicating the need for the official control of importation of poultry into the country.

For the most part, Mr. Lamont had amplified many of the points raised in the paper, but he covered a wider range, and it was not practicable, at that time of the evening, to discuss the details of further diseases. Coccidiosis continued to be one of the greatest sources of trouble among chickens and adult birds, and he agreed that the provision of clean ground for chicks was the most important of the preventive measures.

There would be little doubt that the disposal of birds after they were two years old would do much, as had been the experience of Mr. Lamont, to reduce the prevalence of avian tuberculosis. As to the complaints mentioned by Mr. Little, he was inclined to think that the term "blood tested stock" was often used in such a way as to give rise to serious misconception. It was sometimes used when a flock or part of a flock had been tested only once, whereas one usually thought of this kind of a flock as having had all bacillary white diarrhœa carriers eliminated. Many flocks in the Free State were free from bacillary white diarrhœa, and could be relied upon to supply eggs and chicks which were not contaminated.

Professor Browne had referred to the relationship of avian tuberculosis to the non-lesion reactors among cattle. It was possible that some of the latter cases might be explained on the basis of avian infection, but it was hardly likely that the bulk of the cattle which reacted and showed no lesions *post-mortem* were infected with avian tubercle bacilli, or, if so affected, would react to mammalian tuberculin.

With regard to the alleged prevalence of "gapes" in the North of Ireland, he was asked by Mr. Lamont to state that "gapes" is now uncommon, and this was due to the use of hovers and breeders in the rearing of chicks. It was also their experience that among birds reared on wire, *e.g.*, on the battery system, worm parasites were conspicuous by their absence, but coccidiosis was not uncommon. On the questions raised regarding the infection of man with avian tubercle bacilli, he would refer them to an authoritative article in the *Bulletin of Hygiene*, Vol. viii, No. 1, 1933, in which over 14 human cases were detailed.

It was not possible, as he had indicated, to cover the whole field of poultry diseases in one paper. That would require a series of papers. That one might be regarded as justified if it succeeded in arousing the interest of practitioners in that important branch of veterinary science.

It might also be added that there could be no just grounds for complaint on their part against laymen or instructors treating or controlling poultry diseases if they themselves refused to take an active part or to make themselves acquainted with poultry diseases or their control. He considered that the veterinary profession should be the body to attend to diseases of poultry and other animals, and he would strongly recommend that the whole question should be carefully studied and discussed by the Association or its Council, and a decision arrived at as to whether it was more satisfactory to have poultry diseases dealt with by veterinary surgeons generally or through a number of veterinary surgeons specially appointed for the purpose. That question should be considered at an early date if it was to remain within the ambit of the profession.

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Professor Craig exhibited lantern slides to illustrate the lesions of the diseases mentioned in his paper. He also showed specimens of diseased organs and tissues. He demonstrated the method of applying the tuberculin test to poultry and showed two birds giving typical reactions.

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THE VETERINARY DEPARTMENT OF NIGERIA

W. W. HENDERSON, M.R.C.V.S., D.V.S.M. (VICT.)
Director of Animal Health, Nigeria

Nigeria, including the Mandated Territory of the Cameroons, has an approximate area of 372,674 square miles, or more than three times that of the United Kingdom. It has a stock population of over 3,300,000 cattle, 2,350,000 sheep, 5,800,000 goats, 200,000 horses, 530,000 donkeys, with a few mules, camels and pigs—all of which, with the exception of 1,372 horses, 123,000 cattle, 468,000 sheep, 789,000 goats in the Southern Provinces and 39,000 cattle in the Cameroons, are to be found in the Northern Provinces.

The Veterinary Department was established in 1914 with the arrival of the late Mr. F. R. Brandt as Chief Veterinary Officer and Mr. G. E. Owen as Veterinary Officer. The staff was increased by the arrival after the war of one more veterinary officer. With this small staff scattered over such an immense area, and with no laboratory facilities for the manufacture of the various biological products, it was found impossible to stay the ravages of the cattle epizoötics, especially rinderpest, which were then widespread over the country and

causing heavy losses annually. It was not until towards the end of 1925, when a laboratory had been built and serum and vaccines were obtainable, that any definite and effective policy of disease control was commenced.

The European establishment of the Department to-day consists of a chief veterinary officer, a deputy chief veterinary officer, a pathologist, an assistant pathologist, a research officer, twelve veterinary officers, ten stockmen, three laboratory assistants and one mechanic. The African clerical and technical staff numbers 120, and there are 138 African livestock assistants paid for by native administrations.

Prior to 1925 and for two or three years afterwards, rinderpest alone was the cause of a very heavy annual mortality, sweeping over the country in periodic waves and killing from 50-90 per cent. of the susceptible animals in the herds.

In consideration of the geographical position of Nigeria, with its extensive international boundary offering easy and practically uncontrollable access to diseased cattle, of the almost enzoötic nature of rinderpest in Nigeria itself, and the transport difficulties, especially during the wet season, it was decided that active immunisation carried out on as large a scale as possible, offered the only prospects of successfully combating the disease.

That this policy has been fully justified is shown by the disease situation to-day when, after only a few years, rinderpest is well under control and its complete suppression within sight. The work of rinderpest immunisation has occupied and still occupies the major portion of the time and energies of the laboratory and field staffs, although the other diseases, such as pleuro-pneumonia, blackquarter, hæmorrhagic septicæmia and anthrax, are now also being effectively controlled and by the same policy of immunisation on an extensive scale.

Trypanosomiasis is widespread among Nigerian herds and is the cause of a very considerable death-rate annually. The curative treatment of this disease is being carried out not only at immunisation camps but also by travelling native inoculators who at local centres administer the treatment, which consists of three or four intravenous injections of a 4 per cent. solution of antimony tartrate at five to seven day intervals. This year (1933), to the end of October, some 8,000 cattle have been so treated.

As an indication of the magnitude of the work of immunisation against the various cattle epizoötics which is now being carried out, the following figures of cattle treated from January this year (1933) to the end of October are given: 350,000 against rinderpest, 446,000 against blackquarter, 22,000 against pleuro-pneumonia, 3,000 against hæmorrhagic septicæmia and 10,000 against anthrax. Apart from the small quantities of anti-rinderpest serum made at field camps, all the sera and vaccines used in the field are made at the Veterinary Laboratory at Vom, which is also the headquarters of the Department. A glance at the above figures will show the importance and volume of this work.

It may be of interest to give a short account of the general method of procedure followed in the immunisation of cattle in Nigeria, as it also gives an idea of the daily life of the field veterinary officer.

Immunisation camps are established at suitable places throughout the country and to these camps cattle are brought by the owners for inoculation, and where, in the case of rinderpest inoculation, they are quarantined for the required period, generally one month.

These camps are usually under the charge of a stockman, assisted by a staff of native personnel, who carry out the actual inoculations under his supervision. The officer in charge of the camp is responsible for the supply of rinderpest virus, which is maintained by passage usually through young cattle, less frequently through goats.

The serum is supplied from the Laboratory at Vom. The veterinary officer of the Province or Division is in charge of all the immunisation camps in his area, and at times he may actually himself be residing at a camp and supervising its working.

Simultaneously with the rinderpest inoculation, vaccination against blackquarter and sometimes also against pleuro-pneumonia is carried out. At the camps in an area where anthrax has occurred, vaccination against this disease is also given.

In addition to the work at the camps, the veterinary officer has also to organise and supervise the work of the district inoculators carrying out vaccinations and the curative treatment for trypanosomiasis. He has also to investigate outbreaks of disease in his area, and in this he has the assistance of trained natives, who can usually be relied upon to bring in some definite information on which he can act.

Within recent years the Department has also instituted, and is in control of, a scheme for the improvement of hides and skins. The export trade in hides and skins, and more especially goat skins, is very considerable and much economic loss has been sustained in the past through faults in flaying and drying as well as from blemishes produced by the lesions of skin diseases.

The investigation into the skin diseases, more especially demodectic mange, which are the cause of so much damage to the tanned leather, has occupied the attention of the Veterinary Research Officer for some time past.

In accordance with the policy that the Department is concerned not only with the control of

disease but also with the economic development and exploitation of the herds and flocks of the country and their products, efforts have recently been directed towards the establishment of a trade in clarified butter (ghee), not only locally but also in overseas markets. Without this outlet for surplus dairy products the full economic value of the herds cannot be realised and much money is thereby lost to the country. Already a considerable trade has been developed.

In a country such as Nigeria, where stock plays such an important part in the economic and social welfare of the people, the Veterinary Department fills a very important rôle in controlling disease and developing the economic resources of the herds and flocks, and in this work, as far as Nigeria is concerned, the Department has the active support of the Central Government and the many native administrations into which the country is divided. The difficulty experienced just now is not in inducing the natives to have their cattle immunised but in finding the staff sufficient to meet all the demands being made on our services.

In most of the large stations in the Northern Provinces animal clinics have been established for the free treatment of native-owned animals, especially the various pack animals—ponies, donkeys, mules, camels and oxen—and these give veterinary officers many opportunities of studying non-contagious diseases and for practising surgery.

In the larger stations of Nigeria there are social clubs, and an officer can always get a game of polo, tennis or golf, while most of the stations also have race clubs that hold two or three meetings a year. Ponies are comparatively cheap, so that the most junior officer can easily afford to keep two or three ponies if he is keen on racing or polo.

The work of a field veterinary officer, although hard and often monotonous and the conditions of living in some places far from ideal, and with no proper housing accommodation outside the larger stations, is withal a fairly healthy life and has its compensations for those who love the wide open spaces.

In the Colonial Veterinary Service there is a considerable variety of work on the whole, but often it is the monotony of immunisation work in some lonely part, where no other European may be seen for months, that is so hard to bear. But, as a compensation, there is ample material at hand for original investigation, taken up either from a professional point of view or as a hobby, and a man need never be altogether lost for something to keep his mind and body active.

Then, as further compensation, there is always the periodic leave at home after every 18 months.

The Veterinary Record

January 20th, 1934.

AGRICULTURE

AGRICULTURE, the premier industry of Great Britain, has fallen upon evil times. The agriculturist, crushed by heavy taxation and costly labour, driven from his own markets by less conservative and better organised competitors, handicapped by diseases which decimate his stock, is leaving the land for the cities, or is swelling the ranks of the unemployed.

"But a bold peasantry, a country's pride
When once destroyed, can never be supplied"

and every effort should be made by the State to rectify this lamentable state of affairs. Not only is this necessary for the agricultural community itself but for the nation as a whole, since Great Britain, even in times of peace, is unable to supply its own food requirements, and in times of war may be rapidly reduced to a state of starvation. Desultory efforts have recently been made by the Government to improve matters, with some measure of success. Commissions, committees, boards and similar august bodies have been appointed to enquire into the matter, and after long delays and much talking "about it and about" have recommended remedies sometimes as harmful as the diseases they are intended to cure. The most promising of these would appear to be of the nature of tariffs or quotas which do, to some extent, make the British producer master in his own house.

However, as pointed out in an editorial appearing in a recent issue of *The Morning Post*, greater attention has been given to crops than to stock. It is with the pastoral aspect of the problem that the veterinary profession is chiefly concerned, and we believe that this is the most important aspect, because the state of health of the livestock of Great Britain is appalling and the ever-recurring losses due to animal diseases are the chief cause of failure of the agriculturist and convert his profits into losses and his assets into liabilities. We have only to read the annual report of the Chief Veterinary Officer of the Ministry of Agriculture for the year 1932 to gain some idea of the dire state of affairs against which he and his devoted staff have to contend. Their efforts are herculean and as far as they go are successful, but the laws and regulations which they have to apply do not go far enough. For example, we find that bovine tuberculosis was *reported* to exist on 22,014 premises and the number of animals examined by veterinary inspectors was 302,354. There are, however, we believe, some 3,000,000 cows and heifers in this country which might with advantage be subjected to regular short-interval veterinary inspections if the public and the pastoralists are to be freed from the

depredations of this insidious disease which, according to a recent estimate, costs the country some £2,000,000 a year, to say nothing of the danger to human life and health directly and indirectly due to it. This estimate, moreover, we venture to suggest, is far too moderate. Then there is contagious abortion, which constantly depletes the farmer's herds and, incidentally, his balance at the bank. Even more prevalent than tuberculosis and, possibly, equally costly, this is another disease which is infective to man and therefore a "double-barrelled" menace. We find that there were only 25 outbreaks of foot-and-mouth disease during the year, which in view of the fact that Great Britain is in this respect "open to every wind that blows" and at any moment may be infected from without, must be regarded more as a merciful provision of Providence than a proof of the efficacy of the prophylactic measures at present provided to prevent its introduction into this country. When once established here the Veterinary Department promptly overcomes the outbreaks as they occur, but not before they have occasioned enormous losses through the interference with the movement of stock and farming operations, the slaughter of valuable animals and the disposal of herds which may have taken generations to build up. Then, again, Johne's disease and various forms of mastitis run riot among our herds, swine fever continues to cripple the pig industry, bacillary white diarrhœa and countless other maladies decimate our poultry. How can the pastoralist be expected to contend against such a formidable handicap?

But how often do we find adequate veterinary representation on the commissions, committees, boards and other distinguished gatherings to which we have previously referred? Surely a grave omission, since the veterinarian is beyond doubt the "key man" of the situation. He is the man who knows most about animals in health and disease—how to maintain them in health, how to ward off disease, and how to eliminate it with "neatness and despatch" when confronted with it. Although a keen scientist, he is essentially practical: he could not maintain an existence if he were not. He enjoys the confidence of the pastoralists, otherwise he would not be employed by them. And yet the veterinarian is too often relegated to a back-seat while the politician and charlatan drive the state coach through this morass of veterinary problems.

In a recent issue we advocated the mobilisation and organisation of the veterinary profession and the creation of a State Veterinary Service. We rejoice to know, therefore, that at its meeting on January 2nd, the Council of the National Veterinary Medical Association adopted recommendations for the establishment of such a Service.

Clinical Report

ABDOMINAL RUPTURE AND BI-LATERAL SCROTAL HERNIA IN THE DOG

D. E. WILKINSON, M.R.C.V.S.
Chigwell

Late on the night of July 12th last a client rang up to say he had just returned from the theatre and found his Pekingese spaniel in obvious discomfort and frequently vomiting. The dog was brought in for examination and found to have a very pronounced scrotal hernia. On reduction by taxis the herniated viscus was discovered to be the bladder. This had passed through the left inguinal canal and was distended by urine, which streamed out in a strong jet during reduction of the hernia.

The dog was taken home for the night and returned next morning for operation. On examination prior to operation he was found to have a loop of small intestine herniated through the right inguinal canal, and further a rupture of the abdominal wall in the right iliac region.

As he was in robust physical condition, it was decided to operate on both herniæ and the rupture at once. Under morphia and ether an incision was made in turn upon either side of the scrotum, the inguinal ring exposed and its lumen reduced by suturing with plaited silk. Emasculation was not performed. The skin was sutured with catgut and painted with sol. acriflavine 1:1,000. These wounds healed by first intention and this part of the operation was immediately successful. The rupture was next exposed and closed by silk sutures.

After the dog recovered from his anæsthetic an Elizabethan collar was applied, but on the second night he got this off and licked open the skin wound on the abdomen, thereby infecting this wound.

Suppuration ensued and was followed by a general sepsis and purulent conjunctivitis of both eyes, which took some weeks to clear up.

The dog was discharged cured and restored to his previous condition on September 4th, the only visible result of his illness being a small leukoma on the left cornea.

The writer has never previously encountered hernia of the bladder into the scrotum, although hernia of that viscus through the female inguinal canal is not uncommon.

Comments on Last Week's Clinical Reports

(Contributed)

No. 1.—"Acorn Poisoning," by Messrs. Gould and Morgan.

From considerable experience in these cases I have found that if the case is seen before toxæmia

develops, rumenotomy is a valuable sheet anchor. As regards medicinal treatment, I put great faith in large doses of salicylic acid as an antizymotic and sodii chlor. and treacle as antifermentives.

No. 2.—"Ampulation of the Bovine Digit," by Mr. Hall.

This is a simple operation, but the majority of practitioners do not operate soon enough. The writer has made one important omission: he makes no mention of applying a tourniquet—a most important asset for a clean surgical operation and a great help, especially to the younger practitioners. A little detail, some may say, but it is detail that counts in successful surgery.

LEVERHULME RESEARCH FELLOWSHIPS

The Advisory Committee invite applications for 1934 Research Fellowships. These Fellowships are intended in the first instance for the assistance of experienced workers rather than to add to the provision already existing for workers in the early stages of their careers. The trustees have in mind particularly men and women who are prevented either by pressure of routine duties or by any other cause from undertaking or completing an investigation of value. They have decided, as in 1933, that no definite limit shall be placed on the amount of individual grants, but that they will be adjusted according to the circumstances of each particular case. Fellows will usually be required to work at or in connection with a recognised centre of research, either at home or abroad. No subject of inquiry is excluded from the scope of the scheme, but under present conditions the trustees intend that preferential consideration should be given to subjects in which the existing provision is inadequate.

The list of 1933 awards shows how wide is the field over which the Fellowships have been awarded. The same conditions will apply in 1934 as in 1933, and are set out in detail on the revised application form. Awards will not be made, as a rule, for a shorter period than three months or for a longer period than two years. The closing date for receipt of applications is March 1st, 1934. The awards will be announced in July, and will date from September 1st, 1934. All applicants must be British-born, and they must also be normally resident in the United Kingdom.

Inquiries and communications in connection with the scheme should be addressed to Dr. L. Haden Guest, Secretary, Leverhulme Research Fellowships, Union House, St. Martins-le-Grand, London, E.C.1, from whom forms of application may be obtained.

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When two men were fined at Exmouth for shooting coots on Christmas Day it was pointed out that all wild birds are protected on Sundays, Christmas Day and Good Friday.

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Six hundred horses are dead and many more animals, including herds of cattle, are near death as a result of cold weather and lack of forage in the southern districts of Saskatchewan, where drought and poverty combined render impossible the attempts of the farmers to cope with the situation. Traffic stoppage, due to the cold, interrupted the efforts of the Saskatchewan Relief Commission to provide the necessary forage.

Abstracts

[**Fowl Paralysis.** (Trans. title.) Fritzsche, K. (1933). *Tierärztliche Rundschau, 39,* 30.]

Owing to the confusion of ideas which still exists in the minds of most people with regard to this disease, Fritzsche gives here a resumé of the important points, quoting from his own work. The disease was known to exist at least as long as four years ago, since when it has spread to all parts of Germany.

It usually makes its appearance after the introduction of fresh stock such as sittings of eggs, day-old chicks or older birds from infected premises. It is essentially a disease of young birds and seems to be confined to the domestic fowl although attacking all breeds and either sex irrespective of their physical condition.

The earliest case recorded by the author occurred at eight weeks of age, but the greatest number of cases occur between the ages of three and six months, the percentage of the flock affected varying from 2 to 40.

The affected birds show progressive symptoms. At first they are apathetic, then lose control of one or more limbs. Sometimes there is respiratory distress, blindness and disturbance of the central nervous system.

On *post-mortem* one sees frequently an œdematous condition of the peripheral nerves, which are greyish-blue and swollen up to ten times the normal.

The author concludes by referring to his experimental work and to general measures of control. He believes the cause to be a virus, and was able to set up the disease by the inoculation of unfiltered material more often when the inoculum was obtained from an acute case.

N. S. B.

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[**Deteriorations in Eggs.** (Trans. title.) Thieulin. (1933.) *Recueil de Méd. Vét. de l'Ecole d'Alfort, 109,* 10, pp. 577-601.]

The author discusses his subject from almost every possible cause of alteration that can occur in an egg, the changes being described with methods for their detection, together with limits of such changes that call for rejection of the egg as a fresh food, or for use in biscuit, etc., manufacture, and finally its lowest grade as used for industrial purposes.

A short abstract is therefore impossible, and the original article is recommended to those interested in this important subject.

He introduces his subject under two headings: (1) morphology, ovogenesis, composition and food value of eggs; (2) general etiology of deteriorations. Under (3) the objective study of alterations in eggs, he defines an unaltered egg according to the standard given by the 1908

Geneva Congress, but he also admits the possibility of perfectly preserved eggs.

Specific alterations are then described in two main groups as taking place in (*a*) non-preserved eggs and (*b*) preserved eggs.

In group (*a*), the following are mentioned as inclusions: blood, feather fragments, hairs, coccidia, worms (all three classes)—all being found in the albumen, and either free or fixed. These usually act as bacterial vectors, which cause secondary alterations.

Bacteria and moulds can cause colonies in various parts of an egg, and are seen by candling as both free and movable patches or "spots." The most common bacteria are Sarcinæ, *B. subtilis*, Streptococci, Staphylococci, *B. proteus, B. coli* and Pasteurella. Of moulds, pencillium, mucor and aspergillus (especially *A. fumigatus*) have been found. A sporotrichum producing red spots has been noted.

Changes due to putrefaction are described in detail. The flora of putrid eggs is exclusively ærobic, and incapable of complete proteolysis of egg.

In group (*b*) special deteriorations due to methods of preservation are described. Other bacteria and moulds, in addition to those mentioned in group (*a*) are implicated, and in preserved shell-less eggs (frozen rather than dried eggs) pathogenic germs introduced during manipulations are to be feared.

Under a further heading many deteriorations which occur without apparent modification of the egg contents are chiefly due to pathogenic germs such as *B. tuberculosis* (10-12 per cent. of eggs from infected hens may be infective), the *paratyphoid B.* group of germs, *B. ærtrycke, B. gærtner, B. pullorum* (2 per cent. of all eggs is given as the figure of infection), *B. sanguinarium* and Pasteurella are all specifically described. Any germ mentioned before may be present without causing macroscopic change, and yet be dangerous.

The fourth heading embraces the hygienic and economic points of view.

Finally, French law is shown to be administered by Departments, with the mayor as head to regulate the sale of foods of all kinds. It must not interfere with commercial liberty, nor be unequal in operation, but may be imposed even at pecuniary loss to those interested. It allows the rejection from sale of unsound food, the repression of fraud, and imposition of fines. Details are given of regulations in the Department of Seine.

The author states the three means of maintaining the value of eggs: (1) produce sound eggs, (2) avoid those in process of alteration, and (3) reject those that are altered. Both sanitary and economic points of view must be associated to these ends.

He finally emphasises the value of the egg as a proven complete cheap food. C. V. W.

[Yew Poisoning in Cattle. (Trans. title.) Nevot, A. (1933). *Recueil de Méd. Vét. de l'Ecole d'Alfort, 109,* 10, pp. 607-609.]

Poisoning among a small group of cattle is described. One observation concerns milk from an affected animal being refused by a baby and later by dogs, and detected by the mother of the baby as having an abnormal flavour.

Experimentation on guinea-pigs was made with the same yew as caused the cattle losses. These animals were shown to be very resistant to poisoning by the fresh yew leaves and alcoholic and etherial extracts of all parts of the plant (extracts of 25 and 50 grammes of leaves were readily eaten when mixed with their food and caused no trouble).

The toxic doses of autumn and winter foliage, according to Cornevin, are given as, per kilogramme live weight:—

Horse	2	grammes
Cow	10	„
Rabbit	20	„
Sheep or Goat	10-12	„

Ameline is quoted as observing (*a*) intoxication of calves by milk from their intoxicated dams, (*b*) cases in fowls and ducks through pecking at the contents of the rumen of yew poisoned cows.

Treatment includes bleeding, diuretics, purgatives, injection of physiological saline (artificial serum) and cardiac tonics.

C. V. W.

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[The Influence of the Nutritional State of the Sheep on its Susceptibility to Infestation with the Stomach Worm, *Hæmonchus contortus.* Fraser, A. H. H. and Robertson, D. (1933). *Empire J. Exp. Agric., 1,* 1, 17-21.]

An experiment was carried out by Fraser and Robertson to determine the degree to which differences in clinical condition produced by nutritional factors might affect the degree of parasitic infestation of sheep exposed to an equal chance of infection. The authors conclude that the results show that well fed lambs have a higher degree of resistance to infection than the poorly fed.

Thirty-two lambs three months old which had been hand reared in concrete-floored pens from birth were divided into two groups comparable in weight and appearance and were grazed on naturally infected pasture previously heavily grazed by sheep. The two groups were kept separately but the 16 paddocks used were grazed in turn by each group for the same length of time. Each of the "ill fed" group had daily received 7 to 8 lbs. of green tares and bruised oats. Each of the "well fed" group had received in addition three pints of separated milk and 1 lb. of mixed meals daily. The average number of *Hæmonchus* worms picked up by the

"well fed" group was 31 and by the poorly fed group 103. There were, however, "surprising" individual variations within each group, the numbers actually ranging from 0 to 222 in the poorly fed group and from 2 to 76 in the well fed group. The average weight of the poorly fed group was 60 lbs., of the well fed group 84 lbs.

R. T. L.

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[Nutritional Factors Affecting Resistance to Hæmonchosis. Ross, I. C. and Gordon, H. McL. (1933). *Aust. Vet. J., 9,* 3, 100-107]

Ross and his colleagues have carried out experiments to test the influence of nutrition on the resistance of sheep to hæmonchosis.

Although an immunity often occurs, it was found that lambs may still remain susceptible after a heavy infection with *Hæmonchus contortus*. There were indications, in old sheep, that diet deficiencies had to be severe enough to cause loss in weight before the resistance to the parasites could be broken down, while in some cases, certain types of resistance were found which could not be influenced by nutritional factors. These are considered to be of genetic origin.

D. O. M.

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[Cutaneous Cancer in the Angora Goat. (Trans. title.) Curasson, G. *Bull. de l'Acad. Vét. de France, 6,* 8, 346-348.]

This condition has only previously been recorded in South Africa but has now occurred in the Sudan following the importation of Angora goats from South Africa. The chief characteristics are that it is only met in Angora goats, it occasionally appears almost as an enzoötic affection, the tumours are nearly always melanotic and situated generally in the perineal region. The tumours differ from the melanomata of grey horses (Angora goats are white) because they are of an epithelial nature and the equine melanomata are sarcomatous. Their appearance and evolution do not appear to be influenced by the absorption of magnesium salts as the drinking water was rich in these salts. The perineum is by far the commonest site, though they are also met at the base of the horn, the ear and the shoulder. Under the skin the tumour is sessile or pediculated and of variable size, though ordinarily it becomes ulcerated when it is as large as a nut; it is then susceptible to bacterial infection and infestation with maggots. The tumour is pigmented to a varying degree, but occasionally one is met unpigmented. Growth of the tumour is slow, taking several months, and not until it is well developed do general symptoms supervene, such as weakness, poor appetite, decubitus and pruritus; loss of flesh then takes place rapidly, metastases occur and death follows.

In South Africa it is much more frequent in females than in males, and in the Sudan it has only been observed in females.

The author does not care to make a histological diagnosis of the tumour.

J. S.

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[A Case of Hæmophilia following Castration. Naudin, L. and Pige, M. *Rev. Gen. de Méd. Vét., 42,* 502.]

One of the authors previously reported hæmorrhages in the horse, commonly spontaneous and often fatal, which occurred some weeks after a successful and normal castration, and suggested that it was due to the sudden lack of testicular hormone. Chafron, the same month, reported similar facts.

The authors were called upon to attend a horse which bled copiously from the nose. Five years old, the animal had been castrated by the covered clamp method six weeks previously and had worked and behaved normally up to the day before the hæmorrhage. Bleeding from both nostrils, blood also oozed from the castration wound. The pulse was weak, all the visible mucous membranes very pale—paler than one would expect from the amount of blood on the floor and on the litter. Colicy pains were exhibited, but the fæces passed—a small amount—were not blood-stained. Injections of calcium gluconate and normal horse serum were given intravenously and ergotine subcutaneously. In the evening the hæmorrhage had stopped, but the general condition and pulse had not improved. Adrenalin was injected and digitalis given in electuary. Next morning the animal was weaker, though no further hæmorrhages had occurred. It fell down frequently with legs stretched out, mucous membranes bloodless, pulse almost indistinguishable. Transfusion of 1 litre of blood was carried out and further adrenalin injected; the animal, however, died in the night. *Post-mortem* revealed about 10 litres of blood-stained fluid in the abdominal cavity. In the colon there was a large clot of blood. The other organs were extremely pale. Examination of the blood was, unfortunately, not carried out during life. The authors suggest that blood transfused from an entire horse might be useful in treating such cases.

D. W. M.

Pantothenic acid is the name proposed for a growth-stimulating acid which has been found in many different kinds of plants and animals. This acid has a close relationship to vitamin G and, according to Williams and Lyman of the Oregon State College, is probably more widely distributed in nature than any other physiologically potent substance. When placed in a solution in which yeast is growing it may increase the rate of multiplication 10,000- to 20,000-fold in 18 hours. —*Science*, 78: 2021.

Reviews

[**Fundamentals of Biochemistry in Relation to Human Physiology.** By T. R. Parsons. W. Heffer and Sons, Ltd., Cambridge. 10s. 6d. (4th edition.)]

Biochemistry is a science which continues to invade the various biological sciences and clinical medicine; so much so, that it is becoming increasingly difficult for workers to carry out original work in these several branches of scientific endeavour without some working knowledge of biochemistry. Some consider this latter science to be identical with physiological chemistry, which practically means with physiology itself, as almost every physiological problem nowadays is either one of biochemistry or biophysics. But biochemistry is wider than this, for it must be applied to all the biological sciences, including botanical as well as zoological problems, including the isolation and purification of active cell constituents as well as endeavouring to link up physiological mechanism with chemical structure. It is thus invaluable to workers in all veterinary problems. Nevertheless, the best introduction to biochemistry is undoubtedly through its physiological affinities, and as a means to this end one can scarcely do better than to study the present monograph under review.

"Fundamentals of Biochemistry in Relation to Human Physiology" is a somewhat misleading title inasmuch as almost every word of the book applies equally to animal physiology. The treatment is not sufficiently advanced to draw hard and fast lines between man and the lower animals. The subject is developed somewhat more as a connected story than is usual in scientific treatises and for this reason its fiction-like style is apt to annoy, at first, the reader who already has his biochemical facts at his finger tips. Later on he realises the value of this method of treatment, a method which will enormously increase its usefulness to the student whose knowledge of chemistry is negligible. Such a reader is skilfully conducted through the intricate and usually, to him, misty passages of biochemical knowledge and instead of giving up the hunt in an exhausted condition soon after the beginning, he rides through to the "kill" with a feeling of joy and satisfaction.

The present volume is described as the 4th edition, but it is so very largely rewritten that it might be renamed and published as a new work. There is no doubt that this complete revision has enormously improved the volume and in the present reviewer's opinion has transferred a book of doubtful value into one of great usefulness. The size has had to be increased from under 300 pages to over 400, but the price still remains moderate. Valuable features of the work are the summaries at the end of several chapters and the bibliographical guides to those students who wish to study the problems more deeply. The first seven chapters are devoted to nitrogen compounds, such as proteins, amino acids, urea, etc. The eighth chapter deals with fats, and the three subsequent ones with carbohydrates, including irregularities of carbohydrate metabolism. A chapter on energy considerations follows, and then ones on enzymes, vitamins, protective synthesis, the body pigments and respiratory gases. The last two chapters are devoted to the biological applications of physical chemistry. The least happy chapter is perhaps that on the utilisation of carbohydrates, where the author, in his endeavour to make sure that all the recent advances in this subject are mentioned, has introduced such complexity that the novice is likely to become unduly fogged. The chapter on vitamins is well up-to-date, although knowledge is advancing so rapidly in this subject that the recent synthesis of vitamin C has naturally not been chronicled. It is not yet certain, however, that vitamin A has any anti-infection properties. It is an improvement to devote a separate section to oxidation enzymes in the entirely rewritten chapter upon these biocatalysts. The chapter on the pigments of the body has also been rewritten and greatly clarified, especially by the diagram given on page 311. In fact, one may say that most of the chapters have been considerably improved on those of the previous edition. It is a pity, however, that there is not a section devoted to the endocrine glands, although certain internal secretions are referred to in other parts of the book.

The printing is clear and the introduction of letters in thick type to emphasise particular atoms in organic formulæ considerably improves the reader's appreciation of those portions devoted to chemical structure. Both author and publishers are to be congratulated on the book, which can be recommended to students at the veterinary colleges and to all veterinarians interested in biochemistry.

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[**Treatise of Medical Pathology of the Domesticated Animals.** (Trans. title.) By F. Liégeois, Professor of the State Veterinary College, Cureghem, Brussels, 8vo, 725 pages. 1933. Edited by J. Duculot, Gembloux, Belgium, and printed by the Librairie agricole de la Maison Rustique, Paris. 100 francs.]

In his preface the author draws attention to the great advances in medicine which necessitate a revision of medical pathology.

The subjects are introduced by a brief anatomical, physiological and physio-pathological outline of the particular organ or region under

discussion. He usually first mentions the result of functional insufficiency of the various organs, and this is important when such causal affections are masked by complications requiring immediate intervention to *save* the animal. Later the functional disorder can be treated to *cure* the animal.

Thus the syndromes of the following are chiefly dealt with: Colic, icterus, broken wind, cardiac insufficiency, uræmia and acidosis.

This line of reasoning is especially helpful in neuro-pathology, because the body, being "mapped out" by the study of the various syndromes arising from each segment of the cerebro-spinal column, thus adapts itself for clinical purposes.

All the classic diseases are dealt with, and also many affections which have been accurately defined only recently. Among the latter may be mentioned certain neurites and polyneurites, grass tetany, the psychoses, atrophic myositis of the masticatory muscles, railroad disease, purpura hæmorrhagica, athrepsis, grass disease, and certain dermatoses. Avitaminoses are purposely given only brief mention.

Functional disorders, such as pica, and derangement of alimentation, and the various neuroses due to functional disorders of the abdominal viscera, the bronchi (essential asthma), the heart, the blood vessels and the urinary system, etc., are all dealt with.

Skin affections are grouped together in a large chapter at the end of the book. Those of toxic origin and the various photodermatoses emphasise the careful division of subject matter that has been made. Thus the article on the various photodermatoses is discussed under five headings, *viz.*, Fagopyrism; Photodermatosis due to St. John's wort (*Hypericum perforatum*); Photodermatoses due to artificial forage as lucerne, etc.; Solar erythema; and Photodermatoses due to medication.

The book is paper covered, but the printing is clear, and the subject matter extends to 698 pages, followed by an alphabetical index and also a table of contents. A few printing errors were noticed.

Names of various observers and experimental workers are frequently inserted, but the chief fault to be found with a work of this nature is a complete lack of reference to the actual articles, especially those of recent date, of which mention is made in the text.

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[**Animal Lovers' Annual.** No. 1. Autumn, 1933. Published in aid of the Royal Veterinary College. Price 1s.]

No. 1 of this amusingly illustrated and carefully written magazine owes its origin to the fact that the Royal Veterinary College "is literally falling down," and a request is made for subscriptions, legacies or donations to assist this institute.

The issue which we have before us is illustrated by such well-known artists as John Hassall, Lynwood Palmer, Heath Robinson, Bert Thomas and others equally eminent, and there are illustrated articles by many of our well-known writers on animal subjects. Miss Frances Pitt, than whom there are few possessing greater knowledge of our fauna, describes in her inimitable style the tale of her wild Scotch cat, Satan. "Dogs, Motoring and Cars," by G. A. Adams, "Greyhounds and Greyhound Racing," by John A. Aldridge, are only some of the absorbing articles with which this volume is embellished.

There is a foreword by Sir Frederick Hobday and the issue is lavishly supplied with useful advertisements displayed in pleasing style.

Even for those who have no interest in animals—and where can such people be found these days—the "Animal Lovers' Annual" is ridiculously cheap at one shilling and should be in the hands of everyone.

Report

COLONY AND PROTECTORATE OF NIGERIA

ANNUAL REPORT OF THE VETERINARY DEPARTMENT FOR THE YEAR 1932

The Chief Veterinary Officer, Captain W. W. Henderson, M.R.C.V.S., D.V.S.M., in this report states that, on the basis of taxation statistics, it is estimated that there were in the Colony of Nigeria during the year 1932, approximately 2,500,000 cattle, 2,000,000 sheep, 5,000,000 goats, 500,000 donkeys, 200,000 horses, and a few camels, mules, swine and ostriches. An apparent decrease in the number of stock as compared with 1931 is largely accounted for by tax evasion on a large scale, the Fulani cattle owner suffering from that very common complaint, a scarcity of money. He also experienced difficulty in finding cash to pay his immunisation fees. Nevertheless, during the year 241,700 cattle were immunised against rinderpest, 395,851 against blackquarter, 136,753 against pleuro-pneumonia, 139,050 against hæmorrhagic septicæmia and 2,175 against anthrax. In addition, 14,157 cattle received treatment for trypanosomiasis.

The position with regard to rinderpest was satisfactory, and the isolated outbreaks reported were easily controlled with only a small mortality. The grand total immunised against this disease since the inception of the scheme at the end of 1925 is 1,173,599. The formalised spleen vaccine was applied to 9,681 cattle either for

the purpose of controlling actual outbreaks, or as a routine measure in the immunisation of trade cattle passing through the frontier ports of entry. Its disadvantage is said to lie in the temporary nature of the immunity produced, which is of less than one year's duration. The use of goat's blood virus appeared to give good results at the laboratory, but variable results in the field. Even after the twenty-first passage through goats the virus was as virulent as ever for Nigerian cattle. This is contrary to the experience of veterinary authorities working with "plains" cattle in India. The addition of a 2 per cent. solution of trypan blue to bovine rinderpest serum as a general field measure to control the incidence of red-water in calves undergoing immunisation proved successful. Simultaneous inoculation against rinderpest, pleuro-pneumonia and blackquarter was found to give satisfactory results. Vaccination against pleuro-pneumonia was carried out on a large scale, but variable results were experienced, dependent to some extent on local conditions. Vaccination against hæmorrhagic septicæmia with a formalised culture was continued with favourable results, but the immunity did not exceed two months. Anthrax has not hitherto assumed serious proportions until this year, when two rather extensive outbreaks occurred almost simultaneously. The death of seven native butchers who had handled an infected carcass, occurred. Two thousand, one hundred and seventy-five cattle were vaccinated with a vaccine prepared by the Pathologist, with satisfactory results. Foot-and-mouth disease was reported from all provinces, but is not regarded as of any serious importance in Nigeria. Trypanosomiasis is of widespread occurrence, and curative treatment was carried out extensively. Tartar emetic was given intravenously to horses suffering from *T. vivax* infection and brought about complete recovery. Hides and skins to the value of £500,000 were exported, and clarified butter fat weighing 10,000 lb. was prepared from butter bought from Fulani cattle owners.

The Annual Report of the Pathologist, Dr. G. N. A. Hall, M.R.C.V.S., has, unfortunately, "been drastically cut down for reasons of economy," and has been included as an Appendix to the Chief Veterinary Officer's report. It contains much that is of considerable scientific and practical importance and is worthy of more generous treatment. The preparation of the enormous quantities of anti-rinderpest serum, formalised rinderpest spleen vaccine, blackquarter vaccine, pleuro-pneumonia vaccine, and other vaccines by the Veterinary Pathologist and two laboratory assistants is a notable achievement. Research work and investigations have, in consequence, been limited. Experiments were carried out to find a practical means of eliminating piroplasms from the virulent blood used in the process of rinderpest double inoculation, which occasionally caused a mortality of 10 per cent. in young stock. The swabbing of virulent blood on the septum nasi was found to produce infection, but when an animal is injected with serum at the same time the method frequently fails to produce a reaction and is therefore unreliable. Peritoneal fluid from infected cattle has proved a useful substitute for virulent blood, but larger quantities have to be used. Peritoneal fluid, when rubbed on the septum nasi, will set up rinderpest infection. Goat virus and the addition of trypan blue have been referred to. The preparation of anthrax vaccine by cultivating the Pasteur vaccine received from French West Africa is described. Careful standardisation was necessary before issue. The preparation of anti-anthrax serum for human use, by hyper-immunisation of donkeys, was commenced.

With regard to the vaccine issued for inoculation against contagious bovine pleuro-pneumonia, it is stated that the one hundred and twenty-sixth generation of cultures has been reached, but that it is still too strong and causes swellings when inoculated behind the shoulder. In the Sudan this same strain can be inoculated behind the shoulder of cattle, after the fifteenth generation. Vaccination in the tail is extremely unpopular among Fulani cattle owners. It is again recorded that the hæmorrhagic septicæmia vaccine produced immunity of too short duration: it was therefore withdrawn until other methods could be devised. A vaccine was prepared to protect sheep against pustular dermatitis, and good results were obtained.

In Appendix B, the Veterinary Research Officer, Mr. W. G. Beaton, presents a condensed report on his investigations into the skin diseases of goats, *viz.*, demodectic mange and streptothricosis, both of which constitute a serious menace to the growing export trade in skins.

Ll. E. W. B.

HIGHLAND AND AGRICULTURAL SOCIETY

The Highland and Agricultural Society, at a meeting in Edinburgh, on January 10th, decided to mark their one hundred and fiftieth anniversary by conferring honorary membership upon the Duke and Duchess of York, Sir John Gilmour (Home Secretary), Mr. Walter Elliot (Minister of Agriculture), and the following: Sir John Russell (Director of Rothamsted Experimental Station); Sir Rowland Biffen, of Cambridge; Sir Thomas Middleton, Development Commissioner; Professor J. A. Scott Watson, Oxford University; Professor R. G. Stapledon, University College, Aberystwyth; Dr. John B. Orr, Rowett Research Institute, Aberdeen; Principal W. G. R. Paterson, West of Scotland College of Agriculture, Glasgow; and Emeritus Professor Robert Wallace, Edinburgh.

The honorary members are to be invited to a commemorative dinner on February 9th.

N.V.M.A. Divisional Reports

VETERINARY MEDICAL ASSOCIATION OF IRELAND*

MEETING AT DUBLIN

A General Meeting of the Veterinary Medical Association of Ireland was held in the Veterinary College, Dublin, on Wednesday, November 29th, 1933, at 7.30 p.m.

The following members were present:—Professor T. G. Browne, Professor J. F. Craig, Professor Wm. Kearney, Messrs. A. F. O'Dea, R. J. Nolan, S. Conway, M. J. MacClancy, Sean O'Donovan, R. R. Pierse, J. F. Timoney, D. Reeves, V. E. Stack, J. H. Norris, J. S. MacCann, C. M. Griffin, L. M. Magee, J. D. Whitty, A. A. Donnelly, E. W. Little, P. E. Mullaney, P. Crowley, J. W. Kenny, P. J. Gaffney, P. J. Howard, J. J. Lyons, H. O'Leary and G. J. Crawford (visitor), Professor J. J. O'Connor (Hon. Secretary) and Miss H. Bisset.

The minutes of the previous meeting, having been circulated, were, on the motion of Professor O'Connor, seconded by Mr. Magee, taken as read, confirmed and signed.

Correspondence

Correspondence included communications from:—

(1) Messrs. Mulcahy, McClintock, W. W. Malone and R. A. S. Coulter regretting their inability to attend the meeting and wishing it success.

(2) Mrs. Healy, Midleton, thanking the Association for their kind letter of sympathy in her recent bereavement.

(3) Mr. J. S. MacCann, proposing Mr. Pilkington for membership of the Association.

(4) Mr. Sean O'Braonan, Runai (Aire), Roinn Talmhaiochta, acknowledging the Hon. Secretary's letter of the 9th inst. with reference to the grievances of the veterinary officers of the Department and saying that he will submit it to the Minister as early as possible.

Report of Council

The following report of Council was read:

Two Council Meetings were held since the date of the last Report, August 8th, 1933.

The second Council meeting was held on October 2nd, at which the following business was carried out:—

Change of Title of N.V.M.A.—Mr. P. F. Dolan reported that the resolution before the Annual Congress of the N.V.M.A. of Great Britain and Ireland proposing a change of title for the Association had been withdrawn following a speech by Mr. P. J. Howard which he (Mr. Dolan) and Mr. Dundan had supported.

Fees for Veterinary Surgeons at Greyhound Tracks.—It was decided to defer this matter until further information was forthcoming.

Grievances of Veterinary Officers of Department of Agriculture.—It was decided to write again to the Minister for Agriculture and ask for a reply to the Hon. Secretary's letter of April 10th, 1933. This has been done, and a reply has been received from the Minister's private secretary to the effect that the matter will be considered as soon as practicable.

Reports in Press that Medical Officers had Control of Outbreaks of Animal Diseases.—A letter dated August 11th, from the President of the Society of the Whole-time Medical Officers of Health, explaining the reports in the Press, which could be construed that the Medical Officers were responsible for the control of outbreaks of disease, was read and considered unsatisfactory. It was decided to write again to the President on the matter. This has been done and a reply received.

On the motion of Mr. Howard, seconded by Mr. Gaffney, the report was received.

After consideration of the report it was unanimously approved, on the motion of Mr. MacCann, seconded by Mr. Magee.

Revival of Annual Dinner.—The question of the revival of the Annual Dinner was, on the motion of Professor Craig, seconded by Professor O'Connor, left to be decided by the Council.

Election of New Members.—The following new members were elected: Mr. B. F. Crean, proposed by Mr. P. F. Dolan, seconded by Professor O'Connor; Mr. C. Pilkington, proposed by Mr. MacCann, seconded by Professor O'Connor.

Paper.—Professor J. F. Craig read a paper entitled "Some Poultry Diseases."

This paper was heard with much interest and promoted a good discussion.

[Professor Craig's paper is reproduced, together with a report of the ensuing discussion, at the commencement of this issue.—Ed., *V.R.*]

The meeting concluded with the passing of a hearty vote of thanks to the essayist.

J. J. O'Connor, *Hon. Secretary.*

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YORKSHIRE VETERINARY MEDICAL ASSOCIATION*

Officers Elected at Leeds

DR. G. B. BROOK ON "SPINAL ANÆSTHESIA"

A general meeting was held at Leeds Corporation Home Farm, Templenewsam, Leeds, on Friday, October 27th, 1933. The President, Lieut.-Colonel J. A. Dixon, presided, and there were also present: Messrs. W. Halstead, W. Crawford, H. G. Bowes, W. A. Campbell, W. R. McKinna, E. F. McCleery, J. W. Procter, D. S. Rabagliati, E. F. Angler, H. W. Brekke,

* Received for publication December 24th.

* Received for publication December 11th, 1933.

W. T. Bolton, E. F. Hardwick, W. A. Ireland, J. McKellar, W. T. McGregor, R. S. Smyth, A. H. Watson, E. Ackroyd, E. G. Duncan and the Hon. Secretary. The following were present as visitors: Dr. G. B. Brook, Messrs. J. W. Beaumont, D. A. McPhee, G. V. Tyerman, J. McKinnon and O. Stinson.

Demonstration.—At the commencement of the meeting Dr. Brook demonstrated the indications for epidural anæsthesia in bovine and ovine subjects.

The business meeting followed.

Obituary.—Tribute was paid to the memory of three late members of the Division—Messrs. W. Ackroyd, Halifax; C. Drabble, Halifax; and J. R. Simpson, Ripon. The sentiments of the members were expressed by Lieut.-Colonel H. G. Bowes and the Secretary was instructed as to letters to be sent.

Apologies for inability to be present were intimated from Messrs. J. Clarkson, S. B. Vine, G. C. Barber, M. Robinson, J. Abson and R. Hayes.

Election of Hon. Associate.—Consideration was given to the resignation from the Division of Mr. G. H. Locke, of Manchester, and it was agreed, on the proposition of Mr. J. W. Procter, seconded by Mr. A. H. Watson, that Mr. Locke be elected an Honorary Associate of the Division.

Membership Nominations.—Mr. G. Vernon Tyerman, Harrogate, was nominated for membership by Mr. R. S. Smyth, and Mr. D. A. McPhee, Ripon, by Mr. W. A. Campbell.

Distemper Inoculation.—A letter was read from the General Secretary of the N.V.M.A. asking for information as to fees charged by members for immunisation against canine distemper. Messrs. J. W. Procter, H. W. Brekke, W. R. McKinna and F. C. Scott took part in the discussion of this subject, upon which a decision was subsequently arrived at for forwarding to the Secretary, N.V.M.A.

Accounts.—The annual statement of the Treasurer was accepted and passed by the meeting on the proposal of Mr. D. S. Rabagliati, seconded by Lieut.-Colonel H. G. Bowes.

The balance sheet of the Annual Dinner and Dance, which showed a balance of over £6, was discussed and, on the proposal of Mr. McCleery, seconded by Mr. Crawford, it was decided that this balance be transferred to the funds of the Division.

Office-bearers for the Ensuing Year

These were elected as follows:—

President.—Mr. A. H. Watson.

Vice-Presidents.—Lieut.-Colonel J. A. Dixon, Mr. D. S. Rabagliati, Mr. G. Whitehead.

Hon. Treasurer.—Mr. F. C. Scott.

Hon. Secretary.—Mr. S. Sharp.

Auditors.—Mr. W. Crawford and Mr. G. C. Barber.

Members of Council.—Lieut.-Colonel H. G. Bowes and Messrs. W. A. Campbell, W. Halstead, E. F. McCleery, A. McCormick, W. R. McKinna, W. T. McGregor and J. W. Procter.

N.V.M.A. Council Representatives' Expenses.—The following resolution was passed by the meeting: "That official representatives of the Division on the Council of the N.V.M.A. shall be granted, from the funds of the Division, third-class railway fares when travelling to and from quarterly meetings of that Council." It was further decided that this resolution should take effect as from the beginning of the current session.

Spinal Anæsthesia: Address by Dr. Brook

The meeting was then addressed by Dr. G. B. Brook of the County Agricultural Institute, Derby. His subject was "Spinal Anæsthesia," and in the course of his address the following points were dealt with:—

The Principle of the Injection.—Dealing first with this matter, Dr. Brook observed that there still appeared to be some misunderstanding in this connection, as was witnessed by a letter received by him from a veterinary colleague, whose remarks ran like this: " . . . one has to bear in mind the rate of diffusion of Parsetic (intra-spinally) in the spinal fluid." The injection was always made into the epidural space and therefore never reached the spinal fluid, which was shut off in the sub-arachnoid space; there was no question of the diffusion of the anæsthetic fluid in the spinal fluid: it was rather a question of the speed at which the fluid percolated through the semi-fluid fat of the epidural space. The one exception to that might occur when an epidural injection was attempted by way of the lumbo-sacral interarcual space in the sheep. At that level the needle might perforate into the sub-arachnoid *cul-de-sac*, which was passing back as a gradually diminishing cone to terminate about the middle of the sacrum.

When performing this operation one should always (1) look for the escape of cerebro-spinal fluid from the needle before attaching the syringe; (2) attach an empty syringe and withdraw the piston slightly; should the point of the needle rest in the sub-arachnoid space, cerebro-spinal fluid would be sucked up into the syringe. The cerebro-spinal fluid in all domestic animals was crystal clear fluid and had the same consistency as water.

If those tests proved that the sub-arachnoid space had been entered, the needle should be withdrawn slightly, the tests repeated, and if found negative, the injection might be made. For that reason Dr. Brook looked with favour on Muir's method, but thought that difficulty might be experienced in operating on the fat subject.

Failure to Induce Anæsthesia.—This probably

depended on the escape of the solution through unusually patent ventral inter-vertebral foramina in the sacrum; such failures therefore were most common in the horse. Dr. Brook first read of this explanation in an article by Cuillé and Chelle.

Asymmetrical Anæsthesia.—This was not uncommon, and Continental writers attempted to explain this occurrence by postulating the presence of septæ in the epidural space, such septæ having been demonstrated occasionally both in man and bovines. One-sided anæsthesia was to be expected in any case if the patient was lying on its side at the time of injection and during the time of nerve block.

Dosage.—Dr. Brook set out the dosage in tabular form and said it did not differ materially from that advocated in the original articles. A good deal of information was now available on the dosage required for the bull. There seemed to be some doubt as to whether the penis could be extruded by nerve block without abolishing hind limb control. This was important since, as shown by Stinson, a flaccid, pendant penis might well suffer injury should the bull commence to stagger before assuming decubitus. In theory, it was possible to block the nerve supply to the penis without involving the roots of the sciatic nerves. A diagram of the distribution of the lumbo-sacral plexus was exhibited to illustrate this fact. In practice, opinion varied. Lagerlof, of Stockholm (in a private communication), had written him as follows: "I can tell you that here in the College we, for epidural anæsthesia in bulls, use 50 c.cs. to 60 c.cs. of 1·5 per cent. solution of Novocaine: we have chiefly medium-sized bulls. You must have the bull recumbent for the examination of the penis and the animals generally lose control of the hind limbs for a time of two to three hours after the injection. . . ."

Mr. Howe, junr., of Buxton, had very kindly communicated his experience and method and had written: "(1) In the case of a small bull (Shorthorn) I should give him 8-10 c.cs. and leave the needle *in situ*. If the penis extrusion did not follow, additional increments of 2 c.cs. would be given until the extrusion occurred; (2) For a big bull I should give 10-12 c.cs. at once and then proceed as for a small bull: it is quite safe to leave the needle in position. To the best of my knowledge it would be impossible so to graduate the dose that the penis would hang out of the prepuce with the animal standing." The lecturer thought that Mr. Howe's method was ingenious and warranted extensive trial.

Mr. Oscar Stinson had kindly summarised his experiences in a private communication, which ran as follows:—

"The method has been used in Shorthorns almost exclusively (bulls 9-18 cwts.). From 20 c.cs.-50 c.cs. 'Parsetic' are injected, the yearling bull of 10 cwt. receiving 20 c.cs. Penis protrusion occurs in 15-35 minutes: the dose necessary to extrude the penis affects the control of the hind limbs, but the penis is always extruded before the control of the limbs is lost. If the dose is on the small side the penis may be extruded, and I have performed many operations on the penis with the patient standing."

The lecturer was much indebted to the three authorities quoted for permission to enumerate their findings. Speaking generally, Dr. Brook thought that the Swedish doses were a little excessive: he would support the figure cited by Stinson, but, at the same time, was much attracted by Mr. Howe's method which, in the hands of an experienced worker, might well prove to be the best procedure. To those who had not had wide experience, Dr. Brook thought he ought to say "be prepared to control and cast the bull should danger of injury to the penis threaten." Apart from these complications, epidural anæsthesia was the ideal method for surgery of the penis. He looked forward to advice on these problems in the discussion.

The uses of epidural anæsthesia at the time of parturition and in cases of eversion of the uterus were also discussed. Since the chief points of interest in this connection were enumerated in a previous article [Brook, G. B. (1933.) *Vet. Journal*] it was not proposed to recapitulate them here.

Contra-indications.—Rectal palpation was not possible under epidural anæsthesia; the rectum became ballooned, so that any procedure necessitating rectal palpation constituted a contra-indication.

Undesirable Sequelæ.—(1) Temporary deflection of the tail had been noted by French writers. This was noticed for ten days, after which the carriage of the tail became normal. (2) Permanent interference with the movement of the tail. This had been encountered once by Dr. Brook: the cow was injected in the usual manner during a difficult parturition. About a month later the owner complained that the cow could not elevate the tail. On examination, a hard, painless swelling was found over the first inter-coccygeal space. The animal could flex the tail or move it to left or right, but could not extend it. This resulted in the soiling and excoriation of the escutcheon with urine and fæces. When re-examined nine months later (March, 1932) the condition was unaltered, except that the enlargement had increased and passive elevation of the tail caused severe pain. The general health of the animal was unimpaired; the hind quarters had to be cleansed daily. (3) Tearing of the vagina and vulva was probably more extensive when once established. On the other hand, rupture of the uterus was much less likely to occur, owing to the abolition of straining during fœtal manipulation. (4) Hæmorrhage, when it occurred, was more

severe. Ruptured blood vessels were not pressed upon by the flaccid tissues and bleeding went on unchecked. On the other hand, bleeding points were more easily discovered and hæmorrhage controlled.

Discussion

In opening the discussion, Mr. O. Stinson extended his congratulations to Dr. Brook on the work he had done in this field and said that on this account the profession in this country was much indebted to the lecturer. Continuing, Mr. Stinson gave an interesting account of his experience with the method and instanced the great value it had in bovine practice. In enumerating the various conditions in which he had found epidural anæsthesia to be of value, Mr. Stinson emphasised the value of the interval of time after the injection was given, which he described as "30 golden minutes." He said he had performed urethrotomy in a 15-months-old bull, giving an injection of 20 c.cs., without the animal lying down. He could not tell Dr. Brook whether the penis became protruded, because that had been amputated at a previous operation. He said that he had not encountered any undesirable sequelæ and suggested that laceration of the vagina could be prevented by more careful attention to lubrication during manipulations. He had found epidural anæsthesia valuable in dealing with retained placenta and in parturition in the mare. The doses he had used in foaling cases were as follows: pony mare 25 c.cs. and increased doses, according to size, up to 30, 35 and 40 c.cs.

Mr. F. C. Scott asked whether there was any danger if the solution were injected into the sub-arachnoid space, *i.e.*, into the spinal fluid.

Dr. Brook replied that the dangers were, firstly, that the rate of diffusion could not be controlled, and secondly, that the gravitation of the solution could not be governed if the position of a large patient could not be controlled. Under these conditions a large volume of anæsthetic solution might diffuse or gravitate forwards and affect the cardiac nerves or medullary centres. These difficulties had been successfully solved in human surgery, but the size and weight of our large animal patients would always militate against this in veterinary work.

Mr. J. W. Procter mentioned a case of unusual persistence of anæsthesia in which the patient exhibited slight inco-ordination for 24 hours.

Dr. Brook said that he had never experienced this.

Mr. W. A. Campbell asked if spinal anæsthesia prevented death after uterine eversion, and in reply Dr. Brook observed that he had experienced mortality in cases of uterine eversion, despite the fact that reduction was accomplished early, in cleanly conditions, and under complete anæsthesia. It was therefore suggested that death in these cases resulted rather from pre-reduction shock than from the shock of reduction or post-operative infection.

In conclusion, Dr. Brook thanked all those who had taken part in the discussion: in particular, Mr. Stinson, who had kindly travelled so far to attend the meeting and recite his extensive experiences.

Votes of Thanks.—On the call of the President (Mr. Watson), a vote of thanks was conveyed to Dr. Brook for his great service in attending the meeting to give his demonstration and address. The venue for the meeting was placed at the disposal of the Division by the Leeds City Corporation, and the Secretary was directed to convey the best thanks of the members to that Council for this helpful service.

At the conclusion of the business the members and visitors partook of tea together.

S. Sharp, *Hon. Secretary.*

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DUMFRIES AND GALLOWAY V.M.A.*

SOCIAL GATHERING AT CASTLE DOUGLAS

The Summer (Social) Meeting of the above Division was held at the Douglas Arms Hotel, Castle Douglas, on Thursday, July 20th, 1933. The President, Mr. John Allan, Castle Douglas, presided, and the following members were present: Messrs. R. Craig Robinson, N. H. McAlister, J. Bell, G. W. Davidson, J. Waddell, A. Young, P. McKinley, A. Edgar and F. A. Davidson, Hon. Secretary.

The following visitors were also present: Miss Allan, Mrs. A. Young, Mrs. A. Edgar, Mr. and Mrs. J. Edgar, Shanghai.

The Secretary read the minutes and they were approved, on the motion of the President, seconded by Mr. A. Young.

Obituary.—The President asked the meeting to stand while the Secretary announced the death of two members—Mr. J. W. Hewson, Carlisle, and Mr. J. B. Taylor, Dumfries. The Secretary was instructed to convey to Mrs. Hewson and Mrs. Taylor the sympathy of the members of the Division.

Apologies for absence were received from Miss Burnett, Messrs. J. Cameron, W. T. Hewetson, A. J. Kennedy, R. Simpson and O. Stinson.

Business Arising from the Minutes of the Previous Meeting.—(1) Correspondence was read with regard to the Scottish Committee on Bovine Abortion, and the Secretary indicated that a practitioner from each Division of the Scottish Branch had been co-opted to this committee and that Mr. A. Young had attended the meetings as representing the Dumfries and Galloway Division. On the motion of Mr. Young,

* Received for publication, December 11th, 1933.

seconded by Mr. McAlister, it was agreed to advise the members to fill up the questionnaire issued by the Abortion Committee.

(2) The Secretary indicated that the Scottish Branch had called a meeting of practitioners and that three members from each Division were appointed. At the meeting held at Stirling, Mr. McAlister attended as representing the Dumfries and Galloway Division.

(3) Receipt of a letter from the Secretary of the Branch, stating that the question regarding the election of the President of the Branch had been deferred as replies had not been received from all of the Divisions.

(4) The Secretary indicated that he communicated with the Secretary of the Branch with regard to the candidature of Mr. R. Simpson to the Council of the R.C.V.S. and had attended the meeting. The Branch had agreed to support Mr. Simpson.

Correspondence.—(1) From the Secretary of the N.V.M.A., regarding advertising by unqualified persons. The members agreed to help the Council of the N.V.M.A. should any such case occur in the area of the Division.

(2) From the Secretary of the N.V.M.A., regarding first-aid to animals injured by motor cars. On the motion of Mr. R. Craig Robinson, seconded by the President, the proposals in the letter were agreed to.

(3) From the Secretary of the N.V.M.A. (letter and questionnaire), regarding the Report of the Reorganisation Commission for Milk. Mr. McAlister and the Secretary explained the decisions arrived at and the reply sent by the Scottish Branch, and the meeting agreed to support the action and answers given by the Branch.

Next Meeting.—It was decided to hold the Annual General Meeting at Dumfries towards the end of November or beginning of December, and the Secretary was instructed to ask for short papers from members of the Division.

After lunch at the hotel, the members and their visitors spent a very pleasant afternoon touring the hills of Galloway and the Solway shore, the route being by Loch Ken and New Galloway to Newton Stewart, where the party was entertained to tea by the President. The return journey was made by Creetown, Gatehouse of Fleet and Kirkcudbright. The weather was ideal, the countryside being seen at its best, and those present were unanimous in their approval of the excellent arrangements made by the President to ensure a very entertaining tour.

Francis A. Davidson, *Hon. Secretary.*

The Department of Agriculture for Scotland have issued their Scheme for the Encouragement of Pig-Breeding for 1934. Under this scheme grants will be offered to societies which own or arrange for the use of approved boars of the Large White, Large Black and Middle White breeds for the service of sows belonging to their members.

OBITUARY

James Cossar Ewart, M.D., F.R.S.

1851-1934

An Appreciation

(Contributed)

By the death of Professor Cossar Ewart (recorded in your issue of January 6th), biological science has lost a distinguished ornament. Born at Penicuik, Midlothian, in 1851, he had a notable career as a student in the Medical Faculty of the University of Edinburgh, after which he held a series of minor appontments that formed an admirable preparation for the University Chairs he was afterwards to occupy. Appointed in 1878 to the Chair of Natural History in the University of Aberdeen at the early age of 27, only four years later he was called to the more exacting Regius Professorship in the same subject in the University of Edinburgh. This he held for the long period of 45 years; resigning the Chair in 1927.

Professor Ewart's earlier contributions to science dealt with fish and fisheries; his researches on the anatomy of elasmobrachs firmly established his reputation as a careful and reliable observer of facts. For the veterinary scientist, however, his later work possesses greater interest. At one time certain phases in the embryology of the horse engaged his attention, and those who had the privilege of personal contact with him were impressed and inspired by the enthusiasm with which he made his investigations. His enquiry into the possibility of the influence of a previous sire on subsequent progeny resulted in a publication that has become a classic. His investigations dealing with the origin of the modern domestic horse, though leading him to conclusions that have not found universal acceptance, have had a profound influence on the views of other workers in the same field. As a problem of some economic importance, he afterwards made an extensive enquiry into the ancestry of modern breeds of sheep.

A Darwinian and later a Mendelian, he was led by his enquiries into the origin of the domestic horse and sheep, to view the youthful science of Genetics as potentially of great moment in connection with the breeding of domestic animals; and it was owing to his efforts that an Edinburgh School of Genetics came into being. He established a Lectureship as an adjunct to his own Department, and lived to see this develop in an amazing manner into the present independent Chair of Animal Genetics.

As a mark of appreciation of his interest in veterinary science, the National Veterinary Medical Association elected Professor Ewart an Honorary Member in August, 1920.

In all his investigations Professor Ewart displayed an astounding enthusiasm, and those—and they were many—who visited Penicuik and saw his collections of wild horses, zebras, hybrids, and sheep, were impressed by the liberality, almost prodigality, with which he expended time, energy and money on his experiments and observations.

Professor Charles Porcher

Veterinary science and agriculture in France have sustained a severe loss in the death of Professor Charles Porcher, the eminent French scientist, which took place at his residence in Paris on December 24th, 1933.

Dr. Porcher, who was 61 years of age, was perhaps best known as the Editor-in-Chief of the world-renowned review *Le Lait*. A corresponding member of the Institute, he was Inspector-General of the Veterinary Schools of France.

Sir Donald MacAlister

The death of Sir Donald MacAlister, Chancellor and for many years Principal of Glasgow University, which occurred at Cambridge on Monday morning at the age of 79, removes a notable figure from the academic and medical world.

Sir Donald was Chairman of the General Medical Council during the years 1904 to 1931, and he published, in 1906, an account of the powers and work of that body.

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R.C.V.S. Obituary

Fowler, George C. Orr, Lieut.-Colonel, late R.A.V.C. Graduated New Edinburgh July 14th, 1882; died January 5th, 1934.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Jan. 20th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Jan. 24th.—Meeting of the Comparative Section of the Royal Society of Medicine, 1, Wimpole Street, W.

Jan. 26th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds.

Feb. 2nd.—Annual Meeting of the Royal Counties Division, N.V.M.A., at Reading.

July 30th-Aug. 3rd, 1934.—National Veterinary Medical Association Congress, Edinburgh.

Aug. 13th-18th, 1934.—Twelfth International Veterinary Congress, New York.

Personal

Presentation to William Woods, f.r.c.v.s.

A pleasing function took place at the Public Health Laboratory, York Place, Manchester, on Tuesday, January 9th, 1934, when Mr. William Woods was presented with a silver cigar box.

This had been subscribed for by the holders of the Diploma in Veterinary State Medicine (Vict.) as a token of their esteem and affection for Mr. Woods, on his recent retirement from the position of Lecturer in Veterinary Hygiene to this Diploma.

The presentation was made by Colonel J. W. Brittlebank, c.m.g., m.r.c.v.s., d.v.s.m. (vict.), who, in an apt speech, mentioned that Mr. Woods had held this position since the inception of the course 30 years ago, and had played a big part in making it the success it was at the present time. Colonel Brittlebank expressed the hope that Mr. Woods would be spared for many years to enjoy the cigars with which, no doubt, the box would always be well stocked.

Mr. Woods, in acknowledging the gift, remarked that the whole affair was a complete surprise to him as he did not know, until after his arrival at the Laboratory that day, for what reason he had been asked to attend. He had not regarded himself as a Lecturer; indeed, it had only been under the greatest pressure that he was induced in the first place to undertake the duty. He could say, however, that he had thoroughly enjoyed doing the work, and if his efforts had resulted in any advantage to the veterinary profession in general, he was amply repaid.

The gathering was afterwards entertained to tea by Professor Maitland, the Director of the Public Health Laboratory.

R. C. L.

Appointment.—At a meeting of the Staffordshire County Council, on January 6th, the Finance Committee recommended the appointment of Mr. Francis A. Davidson, as Chief Veterinary Officer, at a salary of £700, rising by annual increments of £25 to £850 per annum.

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VETERINARY INSPECTION NEWS

The West Sussex County Council have decided to appoint a standing committee, representing the public health and agricultural interests, for administering the Milk and Dairies (Consolidation) Act, 1915, and the Tuberculosis Order, 1925.

The regular inspection of all dairy herds in the county at least three times in each year is to be undertaken, and to this end a whole-time fully qualified veterinary officer is to be appointed to act in conjunction with a rota of part-time veterinary officers willing to act under his supervision for the purpose of administering the Act and Order and of carrying out any other duties in connection with the Diseases of Animals Acts and Orders.

The Wilts. County Council have been informed that the Public Health Committee propose to bring forward next year a scheme for the amalgamation of all veterinary services under a

whole-time staff. Meanwhile, two assistant veterinary officers are being appointed and the county area is to be divided between them and the County Veterinary Officer. The latter is to be responsible for the general supervision of the work throughout the county and is to conduct personally all inspections at farms found to be producing tuberculous milk.

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SHEEP SCAB CONTROL IN YORKSHIRE

The present methods of controlling sheep scab are considered inadequate by the Agricultural Committee of the West Riding County Council.

There is considerable concern about the prevalence of the disease at present in Yorkshire, and in a report prepared by the committee they say: "It is impossible to overstate the seriousness of the position which has arisen in regard to sheep scab, and more active veterinary supervision is urgently called for."

The committee recommend the appointment of an additional whole-time veterinary inspector to deal with the disease.

So serious is the position that the Ministry of Agriculture have assembled a large staff of their veterinary officials to supervise the work of dipping, etc.

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IN THE COURTS

Movement of Animals Offence.—A Soyland licensee and farmer, Joseph Holroyd, Blue Ball Inn, was stated when summoned before the magistrates at the Halifax West Riding Court, recently, to have made himself liable to fines amounting to £675.

In outlining the case, Superintendent Gordon said it was the most serious instance of a breach of the Movement of Animals (Records) Order that had come under his notice.

The facts were that Sergeant Edwards and a veterinary inspector for the Ministry of Agriculture and Fisheries went to defendant's premises on December 23rd, the visit being for the purpose of tracing sheep sent off defendant's farm in consequence of sheep scab having been found in sheep which had come from the farm in the previous few weeks.

When defendant was asked to produce his record of movement of stock off the farm, he said he had not got one. It was found that he had sold 170 sheep off his premises during the preceding three months, and had now no stock whatever on his farm.

The conduct of defendant had caused a good deal of trouble to the Ministry and endless work to sheep farmers who kept their stock clean and used every effort to obey the Order of the Ministry for their protection.

In view of the plea of "guilty," the only witness called was George A. Moore, veterinary inspector for the Ministry.

A fine of £5 on each summons, with £4 1s. costs was ordered.

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Dogs (Liability).—In a recent County Court action (Knott *v.* London County Council) the plaintiff, who was employed as a cleaner at one of the defendant's schools, was, while attending to her duties, attacked and badly bitten by a dog owned by a man, who was also in the employment of the defendants as school-keeper. In an action brought by the plaintiff against the defendants claiming damages for personal injuries, the judge found that the school-keeper was aware of the fact that the dog was prone to attack mankind and that, had the action been brought against him, there would have been no defence.

It was held by the Court of Appeal, on appeal from the Divisional Court, that, as the school-keeper kept the dog for his private purposes and not in performance of his duty to the defendants, it could not be said that the defendants directly or indirectly owned or kept the dog; that, as the knowledge of the dog's savage nature had been acquired by the school-keeper as the owner of the dog and not as the servant of defendants, that knowledge could not be imputed to the defendants; and therefore that the plaintiff's action must fail.

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UNDULANT FEVER IN A CHILD

The current issue of the *British Medical Journal* quotes a case recorded in *Arch. f. Kinderheilk.* (September, 1933), by Hauptmann and Eberle, which is stated to be the first in which *Br. abortus* was cultivated from the blood in a child under the age of five years. This case occurred in a girl aged three-and-a-half years, and the disease was due to the consumption of raw milk. The child was admitted to hospital with the diagnosis of septicæmia of tonsillar origin. Death took place after six months' illness, which was complicated by nephritis and pneumonia. Diagnosis was established by the agglutination test before the characteristic undulant fever developed.

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MUSCLE HÆMOGLOBIN

It has recently been clearly established that the hæmoglobin within red muscle is a substance different from the hæmoglobin in the circulation. The muscle pigment has been isolated in a crystalline condition (Theovell, *Biochem. Z., 1,* 252, 1932) and its molecular weight, as determined by Svedberg, is half that of the blood pigment. R. Hill (*Nature, 132,* 897, 1933) has now shown that muscle hæmoglobin has a higher affinity for oxygen than the blood pigment, a fact that must facilitate the passage of oxygen from the blood to the muscle tissue. The peculiarities of the two pigments seem to reside in their protein (globin) moieties.

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VETERINARY EDUCATION IN THE UNITED STATES

"History is being made in the field of veterinary education in the United States," says *The Journal of the American Veterinary Medical Association.* "The period which began about 1925 probably will be referred to as one of the most important in veterinary education in this country. It was in 1925 that the number of veterinary students started upward for the first time since the World War. The last of the private veterinary colleges in the United States closed its doors in 1927. It was in 1928 that we were able to record an upward trend in the number of graduates after having reached a low record of 118 the year before. At about this time the A.V.M.A. Committee on Education began a survey of the situation and a comprehensive report was made by the Committee at the Kansas City meeting in 1931. The same year, Iowa State College adopted the requirement of a year of college work for all matriculants in veterinary medicine. The same step was taken by three other institutions (Colorado, Cornell and Kansas) in 1932. This year Ohio State University joined the list. As matters now stand, we have five colleges in the United States maintaining the equivalent of a five-year course in veterinary medicine, with five still on the old four-year basis.

"At first glance it would appear that there is an increase in the number of veterinary students enrolled this year, if merely the total figure for this year is compared with the total figure for last year. Such a comparison, however, does not reflect the true situation that has existed during the past two years, or since the time that our veterinary colleges inaugurated the so-called five-year course. If we include in our total enrollment figures those students who are taking the pre-veterinary year, we naturally will get a higher number than if our total includes only those students whom we are in the habit of referring to as freshmen, sophomores, juniors and seniors. In this connection, as was pointed out one year ago, Cornell University does not include pre-veterinary students in reporting on veterinary students enrolled each year. If we count only those veterinary students who are freshmen, sophomores, juniors and seniors, we find that the total number this year is only 1,370, as compared with 1,401 a year ago, and 1,378 two years ago. From this it will be seen that the number of veterinary students in our colleges has remained comparatively stationary for three years.

"The figures for this year show a total of 1,550 students enrolled in our veterinary colleges. There are 331 freshmen, 338 sophomores, 387 juniors and 314 seniors."

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NEW ANIMAL PROTECTION LAW IN GERMANY

The R.S.P.C.A., having made inquiries, has been officially informed that new German legislation to prevent cruelty to animals is to come into effect for the whole of Germany on February 1st. The maximum penalty is to be two years' imprisonment, and a fine of R.M. 150, or the fine may be substituted for the term of imprisonment. Repeated offenders may be forbidden, temporarily or permanently, to keep animals. The training of performing animals is forbidden if it involves any pain.

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GROWING DEMAND FOR HORSES

"The improvement in the prices realised for foals and young horses generally is marked in all parts of the country," writes a correspondent to Monday's issue of *The Times*.

"At a time when the values of most other farm stock are depressed this is surely significant. It has not, however, been unforeseen. No one who has studied the June returns for the past ten years can fail to have been impressed by the decreasing number of young horses. During some of these years the numbers of foals have not amounted to 10 per cent. of the working horses employed upon farms. This means that in these years a sufficient number of foals has not been produced to make good the normal annual wastage occurring among farm horses, without taking into account those (and their number is still far from inconsiderable) employed in town work. The shortage is just beginning to be felt, and is shown in the keen demand for promising youngsters of the right type."

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MILK RECORDING SOCIETIES' ACTIVITIES

An extension of the activities of milk-recording societies was indicated by Mr. Harold Jackson, Chairman of the Central Council of Recording Societies, when speaking at the annual meeting of the Durham County Milk Recording Society. The Central Council has been asked to go into the question of pig recording, he said, and the Pigs Marketing Board would be forming a committee in June. It was probable that county recording societies would be asked to help.

The licensing of bulls would come into operation in August, and it was also probable that, in regard to this matter, recording societies would take a prominent part. Mr. S. W. Stokes was re-elected president of the Society.

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ATTACK ON LOCUSTS FROM THE AIR

An aeroplane of Imperial Airways is to be used in Rhodesia to put up poison barrages against locusts as they pass across the country. One of the older air liners is to be stationed shortly at Broken Hill. Apparatus for spraying the poison powder into the air has been sent out from England, and will be attached to the wings of the aeroplane. When locusts are reported, the machine will go up in search of them, and, having found them, will attempt to fly along the front of the swarm, spraying poison into the air in the hope that they will fly into it.

This will be a new experiment in the use of aircraft against destructive insects. The aeroplane has on several occasions dusted such crops as cotton with insecticides, and has helped to rid forests of pests, particularly in Canada. Never before has it been used to attack insects in the course of their migrations.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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A QUESTION OF POLICY

To the Editor of The Veterinary Record

Sir,—As a member of the N.V.M.A. and a reader of the *Record*, I submit this letter for publication in your correspondence columns, believing that this may be the most expedient means of setting down for consideration a problem that is at once delicate and not easy of solution. The problem is simply this, how to deal with a situation arising from the view I hold with, I feel, many others, that the reports received from Divisional Secretaries and the accounts of clinical observations do not receive always, from the technical or professional standpoint, that rigid scrutiny in relation to the validity of the statements contained in them that would merit their insertion in a periodical which is the official journal of the National Veterinary Medical Association of Great Britain and Ireland. It need hardly be said that what may sound impressive and plausible in a spoken address, when it has behind it the interest and support of the speaker's personality, often becomes trite and trivial in cold print. It was put to me recently by a distinguished veterinary worker that the statements now made in some of the clinical reports may be quoted to our discredit a hundred years hence. Some colleagues in the profession have also flouted me with the taunt that they would not care to have their papers published in a journal which had not achieved a high reputation for the scrutiny it exercises on the matter to which it gives publicity.

Let me qualify, Sir, however, at once what

may seem to be, as it is stated above, an unduly harsh indictment against the splendid efforts (as I hold them to be) of the devoted men who, in the past, at much sacrifice of time and energy, have assured the regular publication of our weekly journal. Their task is not a light one; the rejection of unsuitable material and the drastic revision of texts that abound in irrelevancies to the point and substance of authors' narratives have to be done with supreme tact so as not to offend the susceptibilities of the people upon whose subscriptions the *Record* depends and for whose sake it is, in truth, mainly or entirely run. A practised writer, of course, will always take in good part the action taken in good faith by the editorial management of a periodical, but those whose efforts at writing for publication are casual are apt to be readily discouraged from further literary effort. And, the first thing that must be safeguarded above all else is that those members of the profession who have locked up in their vast stores of experience an enormous wealth of shrewd observation and sound judgment—our country practitioners very particularly—are induced, for the enlightenment of their contemporaries and the lasting benefit of posterity, to disclose and place on record their valuable knowledge. Every help ought to be given such men, whose training and inclinations may not have fitted them necessarily for the display of literary gifts, to make permanent, by skilled editorial assistance, their contributions to the advancement of the veterinary calling. I recall that a few years ago the editors of the *Journal of the American Medical Association* published an illuminating little handbook which explained the methods they adopted in culling the rare but valuable points from the prolix unburdenings of medical men at local professional gatherings. We are again told in the many little books that are now available to guide the writer in preparing his texts for publication what immense pains the great medical clinical writers, like Allbutt and Osler (the latter always, I recollect, wrote out his material five times before he was satisfied with it) really took in writing up the descriptions which to the reader ran so smoothly and seemed to him to have come so naturally to the writer.

The opening paper, with subsequent discussion, of the subject "Bovine Sterility" published in the *Record* of January 6th last provided a glaring example of the need for drastic revision of the kind which I have attempted to bring under notice. Bovine sterility is, we know, a highly composite subject. Its present-day importance in comparison with that of the other diseases which are now engaging the attention of veterinary researchers in this country was very properly evaluated in a terse remark by our colleague Major Dunkin in the course of a discussion on one of the papers at the recent Congress meeting at Llandudno; it may be a telling commentary on the action taken by our profession that nearly all the records we now have concerning the extent of the wastage caused among dairy cattle by failure to breed have been compiled by individuals or associations outside the ranks of the profession. There is indeed a very urgent need for trustworthy clinical and statistical evidence upon this economically important and vexing subject. The speaker of the opening address (Captain J. R. Barker), however, instead of contenting himself with a record of such useful observations as must have come in abundance under his own eyes, attempted within three pages to give a complete exposition of the whole difficult subject, and in doing so took with surprising facility within his ambit a survey of the very abstruse additions to knowledge now accumulating from the efforts of the various groups of hard-working men and women (geneticists, endocrinologists, nutritionists) who are steadily shedding from our laboratories new light upon it from divergent and often unexpected angles. From the practitioner's standpoint, however, all the substance of his (the opener's) address was aptly summarised by one of the speakers (Mr. W. Shipley) in eight lines (which moreover ended by including also a very sensible question, bearing in mind the speculative nature of the conclusions as summarised, that was not answered). Very different from the essayist's contribution (for in reproducing, after all, his remarks in print he cannot be absolved from being regarded as an essayist, and not merely, as he would have us believe in his opening sentence, as an advocate of the efficacy of "the spoken word") was the trend of the remarks made by the opening speaker (Major T. G. Heatley) in the discussion that followed. He need never have apologised: all references to his own statements of his shortcomings ought to have been deleted, because in the execution of his proper calling he had none; he confined himself to matters which had come under his own observation, and some of these, such as the detection of actual fœtuses in the discharges of cows that came into œstrus again within a short time after apparent conception, were most valuable. One could have wished that, as he hinted at the end of his remarks, he had "gone on talking for hours," and that a transcript of his remarks had then been handed over to your editorial staff, who would put them into concise form for the benefit of your readers.

What can be said, on the other hand, of the remarks now placed on permanent record by the essayist, of which the following two are examples?:—

"The *Brucella abortus* was a Gram-negative pathogenic micro-organism; it therefore followed that it must satisfy Koch's postulates . . ." It is probably a little unfair to quote this statement apart from its context, for what the writer seems to mean is not, as would be quickly inferred perhaps by a reader, that the germ is to be charged with causing abortion because it does not retain the Gram stain, but rather that inoculation of a beast with it (as in the much-criticised system of inoculating live vaccines) cannot be exculpated from the danger of setting up active disease—not an unfair argument by any means, but not one to be deduced from the sentence quoted.

Again, "Brucellosis, a more convincing term than contagious abortion, can be combated by means of intramuscular injections of contramine and S.U.P. 468 or S.U.P. 36. I am not in a position to state that this represents the last word in therapy against the *Brucella abortus*, but, as I believe there is no greater want than an effective agent, I have used these drugs to gain experience in the fight against this Gram-negative organism."

It would be almost an offence to the good sense of veterinary surgeons to discuss this kind of statement. There are now scores of earnest workers throughout the world who are endeavouring to find some kind of trustworthy means of combating this scourge of the bovine species that is contagious abortion, and in this country we have a powerful Government committee, whose chairman is a most distinguished medical scientist, trying to plan out ways for garnering knowledge on the best methods of dealing with the disease. I merely take the liberty of expressing an opinion on such a statement—an opinion which I would not dare to express unless I

thought it was shared generally by my colleagues in veterinary research in this country—that so long as we allow such wildly speculative and ill-considered fancies to appear in print in our official journal we deserve as an Association to suffer almost any ignominy.

I am, Sir,
Your obedient servant,
J. T. Edwards.

Reidonhurst,
Knaphill,
Woking.
January 15th, 1934.

* * * * *

PYLORIC STENOSIS

To the Editor of The Veterinary Record

Sir,—I was interested to read Mr. Wilkinson's letter on pyloric stenosis in your issue for January 6th. He disagreed with my suggestion that the condition was a rare one, and stated that, in fact, it was very common. I thereupon consulted a number of standard works, notably Wooldridge's "Encyclopædia," Hobday's "Surgery of the Dog," Brumley's "Diseases of Small Animals," Wallis Hoare's "System of Veterinary Medicine" and Glass's "Diseases of the Dog," but all entirely ignored the existence of such a disease, with the exception of the last named. In that book only nine lines were devoted to the condition.

At the meeting of the Central Veterinary Society at which I exhibited my morbid specimen and described the case, a long discussion ensued—not so much as to whether the condition was rare, but as to whether it ever occurred. Two learned professors were heard to remark that in their belief the condition was rare, if not unknown.

Mr. Wilkinson, in his letter, stated that he frequently meets cases of the sort, and suspects it in any instance of delayed vomiting unaccompanied by fever. If this is so, it is inexplicable why all the writers of text-books and so many general practitioners have failed to observe the disease; but I do not wish it to be implied that I doubt Mr. Wilkinson's truthfulness. I know he is a careful observer of symptoms, but I think he has some uncanny method of diagnosing this condition which he has not yet revealed. So far as diagnosis is concerned, Mr. Wilkinson stated, in an article on pyloric stenosis in the *Veterinary Journal* for 1930, that "the symptoms are those of vomition with this distinction from the vomition of gastritis, that the vomiting is not persistent and only occurs after the patient has partaken of a meal."

I would state that, so far as my recorded case was concerned, vomiting was almost continuous for nearly four months, and it did not necessarily occur after a meal. Further, I believe I am correct in saying that vomiting of gastritis occurs after partaking of a meal as well as at other times. Really, therefore, on the face of it, there seems little distinction to be drawn between the two conditions so far as emesis is concerned. In addition, it is, in my experience, quite infrequent to find any rise of temperature in cases of simple gastric catarrh or gastritis; so here again the two conditions are alike.

In his letter to the *Record* Mr. Wilkinson stated that he had "seen the condition in every stage from mere wounding of the pylorus to scirrhus of that organ." I must ask him *how he knew*, in any one of his numerous cases, that he was definitely dealing with pyloric stenosis?—how he knew there was a wound *of the pylorus*, or that the part had become scirrhous? Referring again to the article in the *Veterinary Journal* wherein he said that "stenosis may be of a transient character, yielding to treatment in three or four days," I would ask again, "How did he know for certain that his patients which had recovered from bouts of vomiting over three days, had recovered from pyloric stenosis? Was Mr. Wilkinson able to confirm his diagnosis in all cases by *post-mortem* examination? I hesitate to suggest that they all died, because Mr. Wilkinson told us, in the *Veterinary Journal*, that the disease is usually curable. I submit that the diagnosis is far more difficult and indefinite than Mr. Wilkinson would have us believe. Personally, I am all out to improve my skill in diagnostics and I would gladly adopt any method put forward which would help me more easily to distinguish pyloric stenosis from any other gastric condition. I have not forgotten the value of radiography either, nor was it omitted in my recorded case, as X-ray photographs, after barium meals, were taken on two occasions—one by myself and one at the Royal Veterinary College. Nothing positive was discerned in either photo, and radiography therefore cannot be regarded as an infallible method of diagnosis.

Referring, in his letter, to X-rays, Mr. Wilkinson said "The inflamed stomach is sufficiently opaque to be clearly seen against the screen and the churning movements in that viscus, abruptly shut off by the occluded pylorus, are diagnostic." I challenge that statement as, in my experience, the stomach is not by any means always visible (unless contained air gives one a clue, or it is filled with opaque meal) and certainly no "churning movements" can be recorded on a film.

I sincerely hope Mr. Wilkinson will understand that in debating this matter I am not actuated by any desire destructively to criticise his opinions, but rather with a wish to point out possible weaknesses and help to increase our clinical knowledge of the subject.

Yours faithfully,
Hamilton Kirk.

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AMPUTATION OF THE DIGIT IN THE OX

To the Editor of The Veterinary Record

Sir,—One wonders why it should be necessary or desirable to amputate at the interphalangeal joint to deal with indications 3 and 4 at least, and perhaps with 1 and 2 also, of Mr. Hall's article (*vide* last week's *Record*, p. 37).

These conditions should usually be successfully cured by amputation through the distal phalangeal joint within the claw: this is easier than might be imagined and the great advantage is that the coronet is preserved and the horny wall continues to grow and eventually, with healing and hardening on the sole, forms a foreshortened claw as strong as the intact one.

Amputation of both claws can also be performed with a good prognosis. There was an illustrated article on one such case in a Dutch veterinary journal last year.

Yours faithfully,
J. Edwards.

Weybridge.

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Mr. H. W. Carbury (Auckland, New Zealand), Captain O. V. Gunning (Tutbury), Lieut.-Colonel H. A. Reid (London) and Mr. A. Spicer (New Oxted).

Report of a meeting of the Lancashire Division, N.V.M.A., from Mr. A. L. Mullen, Hon. Secretary.